Engineering Safety Guide 2

External work

BT

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Engineering Safety Guide 2, Issue 2. Item Code: 962887 (A6645)

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Line managers must return receipts
to their local personnel unit

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Distribution
One copy to every person
employed on external work

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Introduction

This guide is specially written for 'hose who are out in all weathers and who have to cope with a more hazardous work arena than those on internal duties. The external person has to contend with a relatively uncontrolled environment – extremes of weather, heavy road traffic, large mechanical aids, proximity of other services, including gas and electricity. They also have to contend with manual handling of equipment and a variety of other areas of risk. Additionally, they may have to work unsupervised for much of the time and frequently encounter damaged plant or equipment. It is important that any such damage is reported immediately using the A1024(A) procedure.

In short, external people are more dependent than most others on their own actions and efforts to achieve safe working. It is absolutely crucial that you follow official instructions to the letter and are properly trained for the work you have to do. Remember that productivity procedures always incorporate the requisite safety measures so that safety, productivity and quality go hand in hand.

Please keep this safety guide handy. Read it, digest it and put its advice into practice. It is one of a series of Safety Guides each one covering a specific field of work activity. A list of these guides is given below.

ESG 1 This guide covers general safety precautions throughout the Business. Every engineer working within BT should have their own individual copy.

ESG 2 Covering external work this gives essential guidance to anyone who works away from BT premises whether on the highway or in Customers' buildings.

ESG 3 Although titled "Internal" it gives safety precautions for working in all types of buildings; BT operational and Customers' premises alike.

ESG 4 The gas precautions and testing guide. It is vital for any external party or for people in buildings with cable chambers or trenches. Contains detailed step by step instructions on all aspects of gas testing and the procedures to be followed when gas is encountered.

ESG 5 This guide explains the principles of roadworks guarding. It gives illustrations of most of the common situations as well as

advice on the more unusual areas of work. A copy should be held by everyone working on or near the highway.

ESG 6 Not yet issued.

ESG 7 Provided primarily for Motor Transport people, this guide gives hints and advice on problems specific to workshops and vehicle servicing.

ESG 8 Written for BT people working externally at radio stations.

ESG 9 This guide covers the safety precautions to be observed when working within radio stations or similar places.

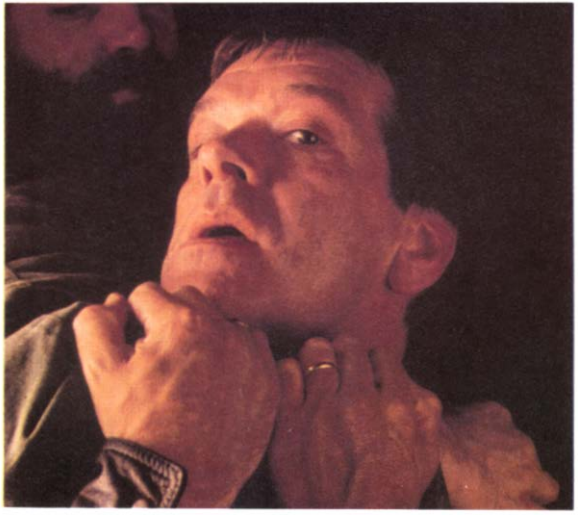
Safety Policy and Guide. This booklet states the safety policy in BT and gives guidance on how it should be applied. A personal copy should be held by everyone employed by BT. It should be read in conjunction with the appropriate safety guide and local policy statement. Do remember however that these guides cannot cover every bit of detail, for which it is necessary to consult the various official sources of information indicated.

Violence to staff

There will be occasions when a member of the public wishes, for what ever reason, to vent their anger on a BT person. Also on other occasions potential assailants may demand equipment. In these situations, where BT people feel threatened, they should:

- try to appear confident;
- try to be helpful, courteous and sympathetic;
- walk away, even if this means leaving equipment – this is not an admission of failure.

BT people are not under any obligation to defend BT property. Singleton working at night in known hazardous areas should be avoided where practical. Where a major known hazard exists in a given area, and there is emergency work which must be undertaken, a police escort should be sought prior to commencement of the work. There is a provision under the Telecommunications Act 1984, (Section 46) for the police to assist BT in carrying out it's duty of supplying a service.



Further information can be found in the BT publication 'Violence to Staff – The Manager's Role' and, for cash handling tasks, Section 14 of the BT Security Manual.

Be sure to report all incidents involving threats or violence to your Manager.

Rough weather

To stop work or not?

No instruction has been written that can indicate precisely when weather conditions are so bad that work should be suspended. This is a matter for judgment by the person on the spot. If you are the technician in charge of work, you should use your discretion to decide if work can continue or if conditions are excessively bad. However, you should still report the circumstances to your supervising officer. Some pointers can be found in the following advice about certain weather hazards.

Thunderstorms

Cease work on overhead or underground lines during local thunderstorms. If aloft, descend to ground level.

Strong winds

Keep protective clothing buttoned up, especially when working aloft, to prevent it ballooning out in the wind.

Weigh down road signs, pedestal beacons and so on using Bags Packing No.1 filled with sand or soil.

Lash jointer's tent to a convenient

step or cable bearer but make sure that the lashing will not trip anyone. Weigh down the tent skirting but not with a petrol engined aid because of fire risk. Take special care when working aloft or handling ladders particularly if the wind is gusting violently. If possible, erect ladders on, and climb from, the windward side of a pole. Have lashing ties and ropes ready to secure a ladder immediately and remember to use extreme care again when unlashing and lowering.

Take care when opening or closing vehicle doors, gates, etc. and when working with elevating platforms and pole erection units.

Ice and snow

Have a stock of rock salt in your van before the onset of snow and ice. Clear any loose snow and then use rock salt to disperse ice, frost and snow from immediate work areas, such as the foot of a ladder or a jointing chamber cover handling area. Cover a more generous area in windy conditions. Where sand or other grit is readily available use these as well. Be careful when walking over snow or ice covered ground. Ice may form on one side of a pole, on arms, steps or fittings. Take great care in climbing or working on poles in this condition. If icing is severe, cease work.

Never try to unfreeze a jointing chamber cover with a naked flame. Thaw out frozen covers with hot water and salt or use de-icing solution to free them.

Hazardous, harmful or irritant

All substances purchased centrally by BT for standard uses have been checked for compliance to the COSHH regulations by the Occupational Hygienist, who prescribes any precautions required. If you follow official instructions and those on the packaging, there should be no hazard to health.

Asbestos

Special precautions are necessary. You must consult and work in accordance with ISIS Directives SFY/CSP/B050 to SFY/CSP/B060.

Compressed gases

Compressed gas (mainly air) is used for a variety of purposes. However, it can cause damage to any part of the body and has been known to kill. It is necessary, therefore to impose rules which include the following:

- Under no circumstances must you ever 'play' with compressed gases.
- Do not cause loose particles to be thrown about as they will enter eyes, ears and skin.
- Never dust yourself down with compressed air.
- Never put your hand in an air stream.
- Do not disconnect any couplings or pipe fittings until the systems have been completely de-pressurised.
- Ensure a filter is placed at the open end of the tube in which a fibre is being installed. This stops the fibre from being ejected from the tube end.
- Never move a gas cylinder by its regulator.
- *Never grease the threads of an oxygen cylinder – it is extremely dangerous.*
- Foreign bodies must be removed from eyes only by First Aid or medical staff.
- If eyes, ears or nose are affected by blast, cover with a clean pad and seek medical attention.
- If skin is penetrated, seek medical attention immediately.
- Most maintenance and repair of pressurised systems is permitted only by authorised people.

More details are given in Safety Manual documents SFY/CSP/B032 and TMA/MAG/J012.

Creosote

Creosote may cause skin irritation. Keep it off your skin by using handling aids, gloves, overalls, etc. When handling freshly creosoted poles protect yourself by wrapping the pole with old sacking, waste paper or an equivalent. Remove any stains from the skin as soon as possible using only an approved hand cleanser or by washing thoroughly with soap and warm water.

Carry only the amount required for the day, use only approved dispensers (eg. Dispenser 5A) and, whenever possible, use a vehicle with a ventilated compartment.

Explosives

Only properly qualified officers are permitted to handle and use explosives. They are reminded that the precautions detailed in ISIS document EPT/OHP/A010 *must be strictly observed.*

Lead

Work with lead is subject to the Lead Regulations ISIS SFY/LAP/B015. However, normal work involving lead sheathed cables is classed as of 'not significant' risk. But two rules remain necessary:

- Avoid inhaling lead dust when cleaning or preparing lead.
- Observe the hygiene precautions specified – see page 9.

Mineral oils

Certain oils tend to remove fat from the skin. Make full use of barrier creams. Frequent exposure may lead to Dermatitis while prolonged exposure can cause sore patches, ulcers, etc. Limit contact with oil and always wash it off carefully and promptly. Avoid clothes with oil soaked areas and never put an oily rag into a pocket, especially a trouser pocket, as this may cause scrotal cancers.

Resins

There are seven main safeguards when working with resins:

- Use Barrier Cream No.9.
- Wear eyeshields, disposable gloves and protective clothing, as directed in SFY/ESP/A014.

- Use the special respirator specified for resin bedding and resin mortar.
- Keep resins or hardeners off the skin.
- Remove any contamination which does occur before it dries or cures using Cream Resin Removing. Wash off well.
- Mix in well-ventilated places. Generally not in manholes.
- Keep well clear of flames or heaters.
- Avoid smoking or handling food and drink. ISIS SFY/ESP/A014.

Optical fibres

Handle optical fibres carefully. Good housekeeping must be maintained at all times. Pieces of optical fibre must be collected and disposed of properly. Use only approved cleaning materials and methods. Refer to ISIS document EPT/COF/D010.

Refer to Safety Manual Directive SFY/CSP/B039 for work on optical fibre systems.

A matter of cleanliness

External work, particularly underground duties, entails additional health risks. These risks are from such sources as handling things that have lain on the ground or are situated at ground level such as pillar covers, cabinet doors, poles and may have been fouled by dogs or other animals. There are also risks from handling lead cables or from contamination of jointing chambers by sewage, rats, etc.

When clearing an area in which to work, take particular care not to handle anything which could cut or stab you, without using protective gloves. Items to keep a look out for include broken glass, nails, sharp edged metal and abandoned hypodermic needles or syringes. Should you sustain an injury in these circumstances immediately clean and dress the wound and seek medical advice if required. Further advice is given on page 66.

Good hygiene is vital. Before taking meals, smoking, drinking or leaving work, wash your hands and, where necessary, face thoroughly with soap and warm water paying special attention to your fingernails.

Other safeguards

1 Before entering a jointing chamber pump out any water properly in conjunction with gas tests (page 63). Wear waterproof clothing and boots in wet situations. Dry out non-proofed clothing that may have got wet, as soon as possible. Then wash or clean it before re-use, especially if you see evidence of rats.

2 Always wear suitable protective clothing and do not allow loose clothing to come near to moving machinery or ropes.

3 Protect skin cuts or abrasions with suitable dressings – water proof ones in wet conditions.

4 Use appropriate barrier creams and gloves where practicable.

5 Be properly equipped with water container, kettle, plastic

bowl, soap or approved hand cleaners, and proper towelling.

6 Use and keep a Bottle Polyethylene No.2 for water that is drinkable. Rinse and refill it each morning. If the available water supply is suspect, boil it before use.

7 Where Bottle Polyethylene No.2 is no longer fresh or has contained suspect water, sterilise it at the earliest opportunity – eg. using Camden Tablets bought locally, as instructed on the package. If grossly contaminated, replace it.

8 Never cut food with a knife that has been used for work activities.

9 Never take food, drink or eating utensils down jointing chambers.

Protecting your body

Personal protective equipment is available for all tasks requiring it. Normally it is issued to the user on a personal basis although it may be held for use on a pool basis. It should be kept clean and in good condition. Any item that is damaged should be changed without delay. Reduce the chances of injury simply by wearing it for all on or off duty tasks involving injury risk. There are specific rules where wearing it is obligatory or particularly important. Always obey any mandatory signs. Such rules for external BT people are summarised here. Remember that you, working in the external environment may benefit from its use more than most.

Protecting your head

The real answer is to wear your safety helmet throughout your hours of duty; but, a word of warning. ***Do not use it in place of a motorcycle helmet.*** It does *not* meet the legal requirements.

Refer to ISIS document SFY/CSP/D015 for details of how to care for your safety helmet and when to exchange it.

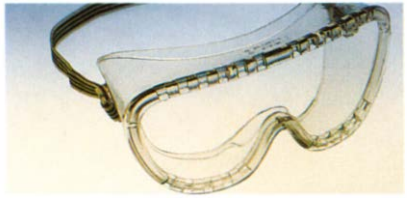
You must wear your helmet

- For any operation or situation involving a significant risk of head injury.
- On work in conjunction with elevating platforms and similar aids.
- On *all* overhead work (including pole erection and cabling on walls) raising and lowering ladders.
- On building and construction sites.
- In underground plant and for rodding and cabling.
- Work in roadways or where risk from traffic exists.
- Near masts, towers and the like. In lift shafts.
- In lofts, above false ceilings, under floors, etc.
- When using cartridge operated tools or chain saws.
- When blasting.
- On work with hoists, scaffolding or safety chairs.
- On work with suspended loads; near lifting appliances in use eg. cranes, beams, etc.
- Use the chin strap on all these occasions.

Protecting your eyes

Full information on eye protection is given in SFY/CSP/D010. To prevent misting up, apply Solution Demisting to the eye shields before use. In windy conditions try to keep to the windward side of your work even if wearing Eye Shields No.3.

You must wear eyeshields No.3:



- When using hammer drills, rock drills or road breakers. TMA/MAG/J011
- For plugging operations.
- If drilling overhead.
- When breaking or cutting bricks, earthenware duct, concrete, etc.
- When using cartridge operated tools.
- For chipping or wire brushing paint, rust, scale, etc.
- When cleaning wire before jointing or terminating.
- If using aerosol sprays.
- When mixing or using resin based materials.
- When hand rodding or repairing continuous rods.
- When using substances that are injurious to the eyes.

You must wear eyeshields No.3 or No.5:

- When striking one metallic tool with another.
- If driving in masonry nails, pins, bolts, collars, etc.
- During cutting or knocking out of cold rivets, bolts, nuts, etc.
- When cutting wire or metal or plastic strapping under tension

(release tension first if possible).

- When handling, coiling or cutting springy wire.
- When adjacent to pole erection digging operations.
- Whilst tree cutting.
- If using tools (or soldering) at, or above, eye level.

Further details may be found in ISIS document SFY/CSP/D010.

Protecting your hands

Wear the correct type of gloves for the job, for example Gloves IR when working near overhead power circuits. Cabling parties, which often have to work in wet conditions, should remember that additional Gloves, Leather, No.1 or 2 may be carried in their vehicles to avoid having to work in water-logged gloves. Examples of jobs for which the right gloves provide excellent protection are:

- Digging holes or trenches. Moving spoil from excavations.
- Handling sharp or rough objects, thorny bushes, etc.
- Working with cable drums. Handling lead cable.
- Dealing with creosoted poles or liquid creosote.
- When handling wood covered with preservative.

See ISIS document SFY/CSP/D014 for more detail.

Protecting your hearing

Exposure to excessive noise can cause incurable hearing damage. In situations where noise levels appear to be excessive, ear protectors may be worn *provided it is safe to do so ie. wearing of ear protectors does not increase the danger overall, outweighing the risk of hearing damage*. Refer to ISIS Document SFY/CSP/D016 for detailed information and the procedure to be followed where the work place is considered to be noisy.

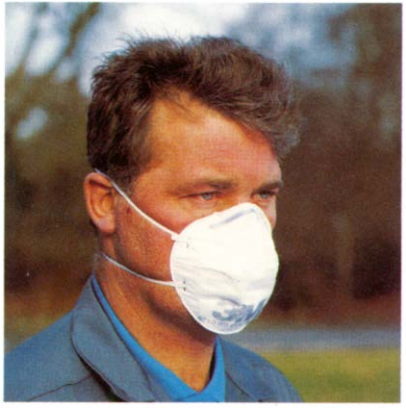
You must wear ear protectors:

- When using pneumatic, hydraulic or electric percussion and hammer tools.
- When using chain saws or cartridge operated tools.
- Where a suspect situation has been identified and pending the results of an investigation.
- In local circumstances identified as excessively noisy.
- In locations and conditions which are indicated by warning notices.

Protecting your lungs

It is just as well to regard all dust as harmful. Wear a respirator if any dust seems excessive.

The Respirator No.3A will generally be most suitable for BT people on external duties. It can be worn together with eye shields but if you have a problem see SFY/CSP/D017.



Protecting your feet

You should wear protective footwear whilst at work – see ISIS documents SFY/CSP/D012 and SFY/CSP/D013. If your duties involve a risk of foot injury you will be provided with suitable protective free issue footwear which must be worn. Boots IR are cumbersome and not recommended for climbing. They are not suitable for driving a vehicle. Restrict climbing in them to situations where ground conditions make their use essential.

Protecting your colleagues

During your work you will probably come across plant or equipment that has become damaged in some way. Damaged plant may also be dangerous. If you do find damaged or unsafe plant you should report it at the first opportunity using a form A1024.

a Use the vehicle Amber Rotating Beacon properly for short duration works or prior to setting out roadworks guarding equipment. The current Roadworks Guarding Manual gives fuller details.

b Wear your high visibility jerkin outside a guarded site and when working on the carriageway. Keep it clean.

c Always warn and guard correctly as set out in the current Roadworks Guarding Manual.

d Before starting work, ensure that prior consultation has been made with the Police and/or the Highway Authorities relating to exceptional traffic problems and, when necessary, that authority has been obtained to impose traffic control.

e Orderly site arrangement and proper guarding ensure safe access.

f Damaged plant means risk. Deal with it, guard it, mark it temporarily and report it as appropriate.

g Where a pole is sited close to the roadside or kerb take great care when climbing not to place your arms or legs where they could be struck by a high sided vehicle. Farm roads are a typical place where this could happen.

Work site – general precautions

Do not forget the more general precautions and advice, applicable to any work area, as contained in ESG 1. The precautions, advice and reminders given here are additional and relate specifically to work on and around external sites in general.

Reminder on tidiness

Keeping the immediate work area free of rubbish, scrap, obstructions, etc., is every bit as important on external work as in Customers' premises. Do not litter the countryside. Take special care in rural areas not to leave behind scrap bits of wire, plastic bags etc. which may injure livestock or wild life. Clear up as you go. Carry suitable sacks for transporting rubbish back to the TEC.

Use a metal tin with closable lid if you have to transport oily or flammable soaked rags, for safe disposal later.

Ground conditions

Muddy, icy and snowy conditions are a common hazard. The temptation is to slog on regardless, yet, some common-sense will avoid most of the consequent risk of a nasty tumble. For instance, scrape the mud from boots before climbing a ladder or before getting in your vehicle. Avoid spreading mud on to carriageways or footways, and, if you are working in a muddy excavation, ensure that there are firm foot and handholds for climbing out.

Take care when walking over fields or building sites not to step into potholes. Damp grass can be very slippery especially where mud is involved.

Kerbs as well seem to await the unwary.

External work involves a major share of unavoidable handling and lifting – and a major share of the accidents. Use the mechanical aids available where possible, but remember that only trained operators may use power driven mechanical aids. Correct lifting techniques are a ***must*** if manual handling is necessary.

On a team job, one person only, must be in charge and giving the orders. See ESG 1 for details.

Reminders on particular overhead and underground lifting tasks appear in the relevant sections of this guide.

Cable drums require a special mention. Where being winched up or down a ramp or skids, keep clear of the 'downhill' end. If manoeuvring a drum manually, use the proper slewing tool never a piece of piping or a batten. Always securely chock a drum

standing on site. Remove battens carefully, extracting any nails as each one is removed, and stack them neatly to one side clear of the work area. If the battens are banded, make sure that you wear eye protection before you cut the strapping. Stand to the side of the drum to avoid being struck by the cut ends of the banding and any falling battens.

Removing and replacing paving slabs

First clear and guard the work area. Break-up paving stones that are cracked, oversized or particularly difficult to remove. If you are working alone you must break up any stone to remove it. Wear appropriate protective equipment especially Eyeshields.

The maximum size of artificial stone that may be handled manually is 900 x 600 x 50mm (3ft x 2ft x 2in) and of natural stone 600 x 600mm (2ft x 2ft) or 900 x 450mm (3ft x 1ft 6in).

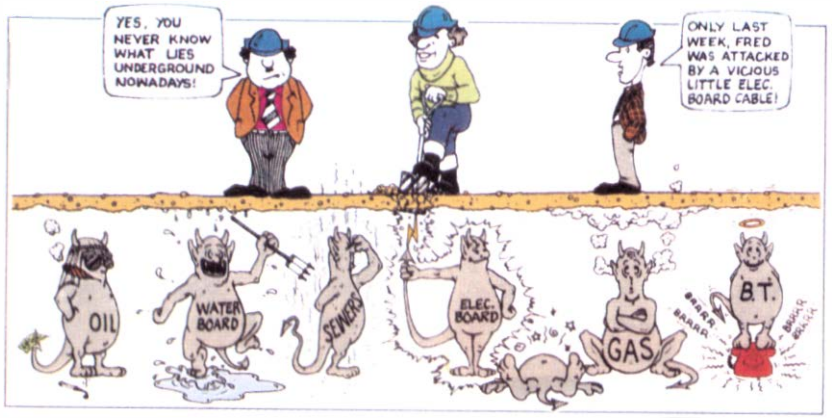
First free the slab with a bolster chisel – if necessary chip away one corner.

To remove, raise one side, insert block(s) and raise fully to the vertical with both hands. Now lift or walk the stone to its temporary

storage position. Be careful to maintain approved lifting techniques. Reverse the handling sequence to bring a stone back into position for relaying. Lower it on to a batten placed to support one side clear of handholds. Use a spade as a lever to release the batten and to shoe-horn the stone into its final position. Tap down with a wooden punner. If a stone has been broken up see SFY/ESP/A015 for safe, temporary reinstatement. Clean stone(s); stack flat in low stacks clear of the working area, battens below each stack.

Digging by BT people and Contractors is covered by guidance issued by the Health and Safety Executive in their document No. HS(G)47 entitled "Avoiding Danger from Underground Services". ISIS document SFY/ESP/C026 contains BT procedures in order to comply with this guidance.

The following points are extracted from HS(G)47 and may be used as a quick reference although it is stressed that the entire document should be available to and read by all BT people involved in digging activities.



Advice to BT people digging near underground services

Underground services particularly electricity and gas can be dangerous. Damage to electricity cables can cause a flash, leading to severe burns or even death. Gas leaks can cause fire or explosion. Damage can result from excavation or penetration of the ground, for example a digging bar or pin supporting guarding equipment.

Underground services may be found in roads, footpaths and on sites. Always assume that they will be there and treat any found as LIVE.

Accidents have happened when people have mistaken one service for another, for example a black plastic covered electricity cable may appear very similar to a BT cable, cast iron gas pipes look very similar to water mains. Always check the identity of the service before you act.

Before starting work

Make sure that you have plans of the underground services in the area remembering that they must be used only as a guide. Service connections of cables and pipes may not be shown, street lighting cables may not be shown and reference points such as lamp posts may have changed.

Always use a suitable locator (see ISIS document EPT/PPS/D010) to trace cables and pipes. Make sure you have been fully trained in their use. If you have any doubts or difficulties consult your supervising officer.

Where possible mark the positions of the cables and pipes on the surface using road marking chalk.

Check for signs of service connections eg. gas meters, water valves, street lighting columns or similar indications. Hand dig trial holes wherever necessary to confirm the position of services.

When starting work

Hand dig when near to buried services using spades and shovels where possible. These are safer to use than picks, forks or digging bars.

Check that any electricity cable which is embedded in concrete has been made safe or dead before works start or that a safe method of working has been agreed with the electricity authority responsible for the cable. Keep a continued watch out for services as the work progresses, and continue to check with the cable and pipe locator.

When backfilling around services use a fine material, don't use bricks, flints, mass concrete or similar material.

If a service is damaged in any way report it and have it repaired. Failure to do so could leave a dangerous situation for the next person at a later date.

Don't use hand held power tools within 0.5m of the marked position of an electricity cable, unless the number of services

present precludes this or surface obstructions reduce the available space.

Don't use hand held power tools directly over cables unless you have already found the cable by hand digging below the surface and there is at least 300mm clearance between the bottom of the surface and the cable or, some physical means to prevent the tool striking the cable have been used.

Don't use mechanical excavators within 0.5m of a gas pipe and if using an excavator near an electricity cable make sure there is no one near the bucket whilst it is digging.

Never use an exposed service as a handhold or as a step into and out of the excavation. Do not attempt to move, handle or otherwise alter the position of any exposed service. If it needs to be moved inform your supervisor who will arrange to have it moved by the owner.

Remember the separation distances between services and ensure that you abide by them. Never build existing services into manholes or jointing chambers and never encase any service in walls, floor, roof or concrete.

If you strike a gas pipe or suspect a gas leak

Remove everyone from the immediate area of the escape. Remember if a service connection to a building has been damaged it could cause a leak within the building. Warn the occupants of this and adjoining buildings to leave.

Ensure that there is no smoking or naked flames within 5m of the gas leak and keep the public away from the area. Telephone the local Gas Company immediately and inform them of the incident and what actions have been taken.

If necessary notify the Police, Fire Service and Gas company and remain at the site to render any assistance that may be requested by them.

Remember – if in doubt, ask your supervisor.

External works on Customer's premises

Remember:

• Whenever possible, make your presence known to the Customer or to a responsible person.

• That a Customer's safety rules (see also ESG 1) embrace the whole of the Customer's site and therefore any external work carried out on that site.

• Where a Customer has a system of work that calls for precautions other than those of BT's, these must be followed *unless* that system will conflict with BT's. In such a case a call to your supervisor will give clarification. Power Stations, Railways, Chemical and Oil refining plants are obvious places where Permits to Work systems are in operation.

The golden rule must be;

"If in doubt – *don't*".

This does *not* mean any relaxation in BT's safety rules for such work:

• That you must not position plant where a maintenance technician may be put at risk later, eg. in the vicinity of the rubbish chute for a large block of flats.

• That you must not use a lift shaft, lift motor room or light well for cabling or block wiring.

• That if called on to work inside lofty hanger type buildings the correct access equipment is available.

• That you must have express permission to use a Customer's roof access way.

• That you should be wary of ground floor windows opening outwards over a service path.

• That you must be doubly careful when on a building or construction site.

• That you must be careful when approaching any Customers' pets or when using Customers' equipment. Lofts in private dwellings are a common area of hazard.

• That only 110v (or lower voltage) equipment should be used on construction or building sites. Mains powered equipment must never be used in manholes or jointing chambers. It is safer to use battery equipment where possible.

Except for areas freely accessible to the general public, this differs radically from normal working conditions. It has a variety of abnormal hazards. Work here, plus work on circuits across railways, (EPT/OHP/B043) is subject to the following prior key conditions:

- Be in possession of SFY/ESP/A012 and the booklet 'TRACK SAFETY HANDBOOK'.
- Carefully study both SFY/ESP/A012 and booklet – you will be given time.
- Check that prior notice of work has been given to the Railway Authority (SFY/ESP/A012).
- Be in possession of a BR standard *orange* high visibility waistcoat (BT's HVJ is not acceptable).
- Wait for the arrival of the Railway Authority look-out(s), before commencing work.

It must be clearly understood that you must follow the instructions in SFY/ESP/A012 and the booklet at all times.

You are particularly reminded not to use standard BT extension ladders where an electrified railway line has an overhead power system.

Note also that red clothing or equipment, is *not* permissible in the vicinity of railway tracks. SFY/ESP/A012.

Near railway crossings

Refer to the current Roadworks Guarding Manual and ISIS Directive SFY/ESP/A013.

Petroleum and chemical companies

Oil refineries and storage premises are very much areas of abnormal hazard. Typical sets of rules are published in SFY/CSP/A100.

High voltage sub-stations

There are three musts:

- The electricity undertaking's ***'authorised person'*** must be present and in control.
- You must follow their instructions or any permit to work conditions.
- You must be familiar with the precautions in EPT/PPS/B011 and EPT/PPS/B014.

Remember to keep well clear of switchgear, transformers, etc. and to keep to any marked safe path.

Use only the Electricity Authority's own non-metallic access equipment. Carry it this way.

Hot stations

These require additional precautions, notably for work on cables within the zone of Rise-of-Earth Potential (Hot Zone).

Generally this zone is now to be calculated, at BT's request, by the relevant supply owner and will be held on a Hot Site Register/Plan. If in doubt of the extent of the zone, contact your supervising officer (or other nominated officer) for clarification.

See EPT/PPS/B011 and EPT/PPS/B014.

Erecting poles

Do not resort to manual methods unnecessarily. Use handling aids and mechanical methods wherever possible. For instance, the mechanised method of pole erection should normally be followed – EPT/OHP/B033.

Timber grabs

Crane type pole timber grabs reduce the need to climb onto pole stacks. Also that the use of hand-type pole timber grabs and pole trucks can minimise direct contact with freshly creosoted poles.

Manual handling

If poles must either be moved or loaded on to a vehicle manually, stick closely to the handling and lifting principles (SFY/CSP/A015) taught to you at training school. Step by step instructions of these operations appear on page 32.

Staffing levels

The technician in charge must always ensure that there are sufficient BT people (see EPT/OHP/B033) to handle the pole(s), being dealt with, and also, grade the party in terms of height to ensure the even distribution of weight when a pole is shouldered.

Manual erection

Follow the procedures in EPT/OHP/B033 where poles are erected manually. Do not use metal or light wooden ladders. Use pole lifters or stout wooden ladders and remember to provide an adequate number of guy lines for steadying purposes.

During erection

Never climb, or let anyone else climb, a pole in course of erection. Wait until the pole is properly set in the ground with all of the back fill rammed down. This applies to work from a ladder or the pole itself and whether or not temporary stays are in use.

On a pole horse

Where a pole is supported on a pole horse and there is any risk of

it rolling, falling or being knocked off, do not leave it unattended.

Handling and erecting poles

When handling or moving wooden poles never let them fall or drop on to the ground or other hard surface. If a pole is dropped it can suffer serious structural damage which may lead to later failure. If you have a pole which has been dropped either from a pole stack, vehicle or while it was being carried do not erect it. Put it to one side and have it thoroughly inspected by the Pole Tester before using it.

Lifting and lowering poles manually

- Prepare to lift the tip with shoulders locked. Do not lock your fingers below the pole.
- Raise the tip onto the front person's shoulder(s) – one person changing sides if 2 people are needed to support the tip.

- Raise the butt onto the shoulders of the remainder of the party. Change sides as required so that all people are on the same side.
- Adjust the position one by one along the length of the pole before moving off.
- Lower first to arm level then tip first to the ground. Do *not* throw it off the shoulders.
- A pole is usually carried on shoulders with all on the same side – so that the pole can be dropped clear in an emergency.
- For cross country work or where members of the party vary greatly in height, a convenient alternative method is shown here.
- Lay out a zig zag of rope

(approximately twice the length of the pole) to suit the number of people. Roll the pole on to the rope and secure the rope ends. Use the rope loops, equally spaced, as carrying handles.

A further alternative is the use of pole timber grabs.

Loading onto vehicles manually

At the rear of the vehicle, shoulder the tip. Raise the butt to approximately waist height.

Move forward. Support the tip on the rear bolster. Advance it well forward into the vehicle body. Ground the butt temporarily.

One person enters vehicle body to support and guide the tip. Raise the butt again and feed the pole forward into the carrying position.

Secure poles front and rear individually as each is loaded. A staple on the rear lashing is a useful precaution.

Unloading of poles from a vehicle is a simple reversal of the loading process after removing the staple.

Pole stacks

Avoid climbing on pole stacks. When this is unavoidable be sure that those underfoot are properly wedged or otherwise secured. When poles are laid or temporarily stacked by the roadside, fasten them together or to a standing pole by means of wire or rope. See ISIS document BPP/PLG/D265.

Manual recovery

Usually only isolated or awkwardly sited poles will be recovered manually. For other than straightforward recoveries and replacements, the Supervising Officer has to ensure that:

- All members of the working party have the experience and training to carry out the work safely.
- The number of technicians is adequate for the class of pole and the precautions required.
- If a pole has to be cut down in sections, that the correct equipment is available, eg. the Pole Recovery Rig.
- When taking down a pole do not disturb the foundations until all wires have been removed and all technicians have descended to ground level. Always fix guy lines to steady it during lowering.

Never recover a pole by using the boom of a Pole Erection Unit to loosen it, always use the pole jack provided.

Where, exceptionally, a 'D' pole is recovered manually take special precautions EPT/OHP/B033.

Temporary construction

Makeshift supports for temporary lines, notably on building sites,

have been the cause of a number of serious mishaps. Where a support has to be erected for a temporary line, wherever possible use a standard pole and construction method. Where this is not possible observe these basic rules:

- *Do not climb any substandard structure or place ladders against unsuitable supports.*
- Report any sub-standard supports seen – use Form A1024.
- Use a Platform Elevating or equivalent safe means of access, to remove wires or attachments to substandard supports.
- You may use an existing support so long as you are satisfied that it will clearly afford a safe support for both wires and ladder.
- Seek advice from your supervisor if you are unsure about a particular situation.

Test the pole before climbing see ISIS document EPT/OHP/C021.

It is your responsibility before starting work on any pole, including one not owned by BT, to test the pole and any strut for soundness and make sure it is safe to climb. Hollow poles must never be climbed and are not therefore included in this general test requirement.

Poles marked 'D' must not be climbed.

A reminder of the general test is given below.

Test one – the three metre mark

Use the three metre mark in the manner shown to check that a

pole is set at the correct depth. Stamp aside or cut away, any grass or growth at the foot of the pole.

Test two – hammer test

With a one pound hammer tap all round the ground line, making occasional reference taps 600mm to 900mm higher up. Listen for a change in tone to the dull or dead note indicating decay. If test indicates decay or you have

doubts about conditions below ground, excavate to a spade's depth, clean and hammer test

the exposed section.

Test three – probe test

Decayed wood will offer little resistance to your Probe Pole Test and will not grip the point. Use it to establish the extent of surface decay which may be seen or suspected after the hammer test.

Do not climb any pole that fails the tests.

Additional checks before climbing

Hedgerows
Check a pole

set in a hedgerow for hedge-cutter damage – usually found at a height of 1.5 to 3 metres.

Non-wooden poles
Hammer and probe tests do not apply. Give these poles a very close visual inspection – EPT/OHP/C021.

Stays
Examine for signs of rust, corrosion or damage.

Doubts

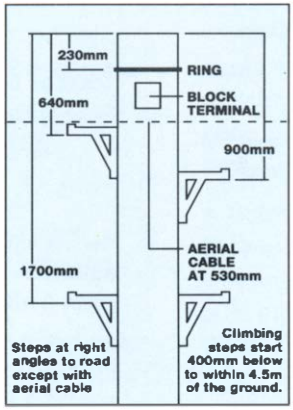
If you are unsure about judging the soundness of a pole, seek advice. *Don't climb it.*

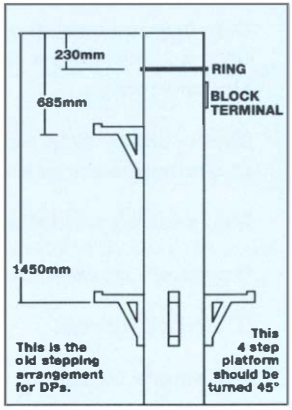
Remember as well, damage to poles may happen from unusual causes eg. Woodpeckers, gunshots or vehicle damage. Always be alert.

If a pole is within one metre of spiked railings, glass topped wall or similar it must *not* be climbed. Treat it as a 'D' pole.

Check that pole stepping looks up to standard.

The left hand sketch indicates the





DEFECT	ACTION	IMMEDIATE PRECAUTIONS
No 3-metre mark. Set at too shallow a depth.	Treat as D. Submit Form A1024.	Do not climb pole.
External decay less than 6mm deep; or isolated 25mm pockets less than 30mm deep.	No action.	
External decay greater than above.	Treat as D. Submit Form A1024	Do not climb pole.
Internal decay.		
Decay at pole step mountings.		
Cuts in wood more than 30mm deep x 25mm Wide x ⅓ of circumference.	Treat as D. Submit Form A1024.	Do not climb pole.
Cuts in sheet metal poles over ⅛ of circumference or buckling.		
Stay severely weakened.	Renew where practicable otherwise submit Form A1024.	Do not climb pole until renewed.
*Loose or corroded steps.		*Do not use as a handle.
*Corroded fittings.		*Do not use as a handle.
Inadequate stepping.	Fit additional step(s) or submit a Form A1024.	Climb with special caution.

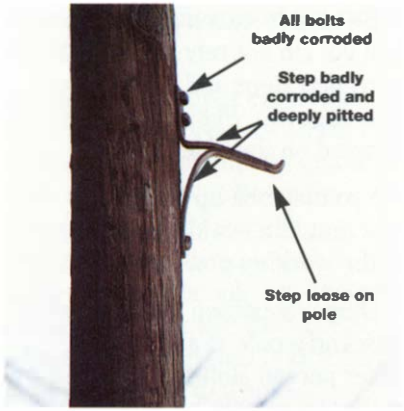
principles for stepping new poles. A medium DP stepped to the old standards (right hand sketch) remains acceptable until such times as it requires complete re-stepping. Always check for loose or badly corroded pole steps as you climb. Look for and replace any steps marked 1CDD88

Note 1

The table gives reminders only on common defects. See EPT/OHP/C021 for greater detail.

Note 2

For emergency access to a 'D' pole use a Platform Elevating or Kits Staging except that the staging must not be used on a joint user pole. Under no circumstances may a 'D' pole be climbed.



Defective Pole Step

Access equipment reminders

Check with ESG 1 for information on the safe use of access equipment.

Keep a close check on your ladder for defects. *Never use an unserviceable ladder.*

Do not temporarily support cable or wire on the ladder from which your are working. If practicable secure your ladder bottom and top. Wear suitable footwear.

Climbing poles – basic rules

It's a must – you must always use a safety belt for work on a pole.

- Make sure you are wearing footwear approved by BT for climbing.
- Lash ladder at bottom and top.
- Whenever possible, aim to climb on the side of the pole from which you intend to work. See page 42 for turning round on a pole.
- Before climbing, look at the pole to establish any obstructions which could impede climbing the pole or belting-up in a particular position.
- Climb unencumbered other

than by a 'Belts Pocket' with a lift line tucked loosely under your safety belt so it will readily pull free if it snags.

• Do not carry tools, testers, cable, wire, fittings, etc. on or about your person whilst climbing or descending, other than that which can comfortably be kept in your Belts Pocket. Raise or lower such things by lift line.

• Wherever possible, climb the pole so as to avoid repeated belting up and unbelting. Where belting and unbelting is necessary, do not take short cuts. Carry out the process carefully.

• Maintain the ladder climbing technique of moving foot and hand on the same side, in unison as far as you can. If the going gets tough, fall back on the method of moving only one limb at a time.

• Be sure to check pole steps as you go. Do not rely on loose or corroded steps and fittings (see also page 35). Place instep well forward on the pole step.

• You may belt-up before reaching the working position or at the working position.

• Only one person may ascend or descend a pole at a time. Any other person aloft must cease work and remain belted-in until the climber is belted-in or on the ground.

• *Never throw tools and fittings down from, or up to, anyone on poles or buildings.*

• *It's a must – you must always use a safety belt for work on a pole.*

Working position

On an angle pole, work outside the angle, that is, on the side away from the direction of pull of the wires or aerial cable, so that a break or slip does not put you at risk.

Ladders

A ladder should only be erected in the carriageway if it is absolutely necessary and unavoidable to do so. A ladder situated in the carriageway should, whenever possible, be protected by a vehicle

A ladder on the footway needs no special guarding. It should be placed at the correct angle for safe working, which is one out to four high, and in this position there is no possibility of a blind person walking into the ladder if they are correctly using their stick to detect obstacles.

If the footway is busy and there is risk of pedestrians running against the ladder, a second individual must foot the ladder with their full weight the whole time that a person is on the ladder whether ascending, working or descending.

Additionally a ladder erected on a footway against a pole with its feet on the footway should be guarded with a Guards Joint Box if there is a risk of pedestrians walking under the ladder and into the ladder tie, or if people are likely to congregate near the ladder, eg. where a bus stop sign is attached to or is adjacent to a pole.

Your life depends on your safety belt when aloft. Store and use it carefully. Do not trail the pole belt along the ground.

Change your safety belt immediately if it is defective or you are not satisfied with its condition, particularly with the operation of the latch.

Maintenance of the safety belt

No maintenance is necessary except, if required, to clean the belt.

- surface dirt may be wiped away with a good quality soap and a damp sponge – *do not use detergent or washing up liquid;*
- work up a good lather on the sponge – not on the belt;
- wash the entire belt with the lathered sponge;
- rinse the sponge and wipe the belt free of lather;
- wipe away surplus moisture with a clean cloth;
- hang the belt to dry in an airy place – do not place it near to direct heat or sunlight.

In extreme cases, paint can be

removed using white spirit. The belt must be thoroughly washed afterwards to remove all traces of the spirit.

After washing and drying, belts must be thoroughly inspected before use.

See Safety Manual document SFY/ESP/B014.

Checking the safety belt

Before you use your safety belt, you must check that it is in good condition: make sure that webbing is not torn, cut, abraded, damaged by heat or corrosive substances. See that there is no broken, cut or worn stitching and that the metal fittings are not cracked, rusty, distorted or have sharp edges.

Checking the snap hook on Belt Safety No.8

Make sure that the latches can be fully depressed, that definite spring resistance is felt and that they restore fully and automatically on release. They must not jam in any position.

Check also that side play at the latch pivot is not excessive.

Check that the keeper cannot open more than 2mm unless the trigger is operated.

Under no circumstances must you attempt to make any sort of repair to a safety belt.

If a belt is damaged, it must be labelled as being unserviceable and returned to the local stores for disposal.

See Safety Manual documents SFY/ESP/B014 and SFY/ESP/B015.

Using Safety Belt No.8

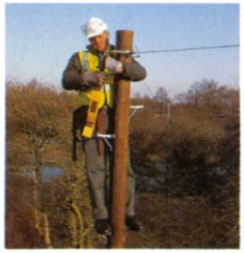
1 Always check the safety belt and snap hook before use to ensure it is not damaged.

2 Adjust the body belt to fit firmly round your waist – *never loose enough to slip down over your hips. Buckle it on by passing the smaller rectangular fitting through the larger.*

3 Ensure that the pole belt is on short adjustment, tuck in the free

ends and place the pole belt diagonally over the shoulder.

4 Climb unencumbered with the lift line tucked loosely under waist belt to the position where you wish to belt up. This can be at the top of the ladder, on the climbing steps, just below the working steps or on the working steps. You must be well balanced and in a stable,secure position. Ensure there is space to easily pass your arms around the back of the pole



clear of any loose wiring or other similar obstructions. At that position embrace the pole with the arm on the same side as the shoulder used to carry the belt.

5 Pass the snap hook round the back of the pole to the hand of the arm gripping the pole. Take over the arm hold with the other arm.

6 Now bring the snap hook round and engage it onto the 'D' ring. Double check by looking at the latch and by moving the pole belt backwards and forwards to ensure correct engagement.

7 Position the anti-friction pad squarely behind the pole and take your weight on the pole belt. You should be held in a very erect position. Now ease out on the pole belt until you are in a comfortable working position.

8 To pull back from an extended reach, ease your weight on the pole belt and pull up on the belt.

9 Before un-clipping the snap hook, always pull up on the pole belt until you are upright enough to cradle the pole with an arm. *Never* un-clip at arms length while relying on a hand hold alone.

Do not just drop the pole belt end prior to descending. Reverse the fastening procedure properly and park the belt diagonally over one shoulder.

At night

During the hours of darkness overhead work may not be practicable. In any event, it must never be attempted unless the work site is adequately lit and it may be subject to special procedures depending on the type of work and the location.

Emergency work, generally where the condition of the overhead plant could be a danger to the public, should be enough to remove the hazard. An example of emergency work would be where a pole has collapsed and has fallen into the road and the Police have called out BT people to make the area safe.

Turning on poles

Moving to a new working position on a pole (often called 'pole top turning') is permitted but only by using the correct method.

Do not turn on poles if:

- the position of pole-mounted hardware such as struts, stays and wires make the manoeuvres impracticable;
- you are prevented from turning on the side of the highest *climbing* step. If you try to turn the other way, you will find the step down is too far to reach.

In these cases, always descend to the ground, re-position the ladder, re-lash the ladder and then re-ascend to the new working position. If this is not practicable, a Platform Elevating or Kit Staging must be used.

You must be securely belted to the pole before attempting the manoeuvre.

You are permitted to turn on poles but only by complying strictly with the following rules and method:

- you must have received appropriate instruction to perform the manoeuvre;
- the position of pole-mounted hardware such as struts, stays and wires must not make the manoeuvres impracticable;
- take each stage at a time and do not move to the next stage until you feel safe and confident to do so;
- ensure your clothing and pole safety belt cannot snag on the pole steps;
- keep both hands free;
- ensure the work area is not cluttered unnecessarily with tools and equipment by lowering them

to the ground in a tool bass;

• be careful not to catch your hands, knees or ankles on pole steps;

• turn only on the side of the pole which takes you past the highest *climbing* step. If you try to turn the other way, you will be unable to reach down far enough.

Method

• start at the normal working position on the working steps;

• you must be belted to the pole but with the belt adjusted so that there is just enough slack for clearance between your body and the bass steps;

• if the top climbing step (i.e. not the working step) is on the right, {left,} step down onto it with your right {left} foot;

• carefully turn your right {left} foot through 90° so that the toe of the boot faces in towards the pole. Ensure the boot is placed so that it is supported along the full length of the step with the ball of your foot directly over the step;

• take your time to ensure you are confident to transfer the weight to that foot;

• move your body sufficiently round the pole to enable your left {right} foot to be moved to the working step above the other foot. As you move your left {right} foot, rotate it 180° so that the inside of the ankle is next to the pole and the foot is at the correct working position on the step;

• continue to move your body in the same direction;

• transfer your right {left} foot onto the free working step and continue moving your body until you are in the correct working position,

• where crown steps are

encountered and there is sufficient clearance for you under the drop wires, aerial cables or other overhead plant, use the four steps to turn. However, if there is insufficient clearance, step down onto the top climbing step and complete the turn as above.

Watch the weather

Take care, particularly in high winds, to avoid lines being caught by passing vehicles when raising wire or cable by lift line.

Grease-filled cable

After working on grease-filled cables, ensure that your hands and footwear are free from grease before climbing or descending a pole. Avoid contaminating pole steps with grease.

Two on a pole

Use Stirrups Pole Step to provide a safe second working position. Remember the rules for climbing (page 37). It is good practice to use two ladders to ease access problems.

Overhead wiring and cabling

Any major unbalanced change in pole head loading such as cutting away several dropwires or a sudden shock load such as a vehicle snagging a sash line, poses risks of pole collapse and risks to technicians aloft and the general public.

Provide additional stays permanent or temporary as appropriate to compensate for any large change in the pull or direction of pull, of wires or aerial cable. This will avoid any risk of pole collapse, particularly if there is undetected decay in the pole. Take the strain on a temporary termination before cutting wires or cables. Release the temporary termination slowly to avoid jerking and lower the wire or cable by sash line. For the recovery of ringed or lashed cable take all the cable down before disturbing the suspension wire. Operations of this kind must not start until all BT people concerned have been warned and that those aloft have confirmed that their safety belts are fastened. With pole recovery do not release stays (including temporary ones) until everyone has descended the pole.

Points on erecting wire

Remember to examine existing house attachments as well as pole

fittings. Replace or recover any corroded or insecure item before starting other work. Do not use 'Spikes Insulator' for new work or renewals. In fact, recover any existing Spikes Insulator if it is practicable and safe to do so. Be sure that your ropes and other equipment, etc. for erecting wire and cables are in good condition. Tension wires, especially drop wires, from the pole rather than the building end. Work from a secure position on the pole – at angle poles on the side away from the direction of pull of the wires – and not from your ladder.

Follow the correct procedures for erecting wire and cable across a road. In particular:

- observe the limitations for solo working;
- never lay drop wire across a road and climb dragging the free end behind you;
- use the proper sash line procedure;
- at a road crossing, trap your sash line with one foot while you remove slack ready to pull up – to prevent the line being raised into the air before the road is clear of traffic;
- be sure to wear eye shields when cleating wires, handling springy wires, etc;
- when cutting, hold the wire to prevent the ends springing towards you, and turn back the free ends of cut wires and coils, against risk of injury during subsequent handling;
- when stripping insulation from wire ends, use the correct tool. Direct the stripping action away from your person. Use emery cloth where you have to clean cadmium copper wire.

Points on aerial cable work

Before you carry out any work on a suspension wire or aerial cable, examine the suspension wire and fittings from the pole at each end of the span. This also applies for self-supporting aerial cable terminations. Take special care where part of a suspension wire span may be exposed to corrosion, for instance at a railway crossing. For access to the cable span itself use, which ever is most practical, either an elevating platform, Kits Staging or scaffolding or lower the cable to the ground. The use of rigging chairs and similar devices, is prohibited. Where an air cylinder is used to supply air to an aerial cable, secure it in an inconspicuous position to reduce the possibility of vandalism.

Overhead power – a word of caution

As the effects of contact with mains power lines are so serious it is absolutely imperative that contact with such power lines is effectively prevented. The basis for this lies in built-in safety standards for line construction – mainly maintaining minimum clearances between BT lines and power lines. However, this must be backed up by BT people observing joint user working methods.

Read EPT/PPS/B035 and SFY/CSP/A030 for detailed precautions.

Categories of power

For these purposes low voltage (l.v.) means up to 1000 volts a.c. and high voltage (h.v.) means over 1000 volts. Can you identify power routes in these categories? If you have to work on external circuits near such routes you most certainly must be able to.

If you are in any doubt as to the voltage of a power line consult your supervising officer before starting work. Here we can give you only pointers to identification.

Recognising H.V. lines

Typical examples of h.v. power lines are illustrated on page 48.

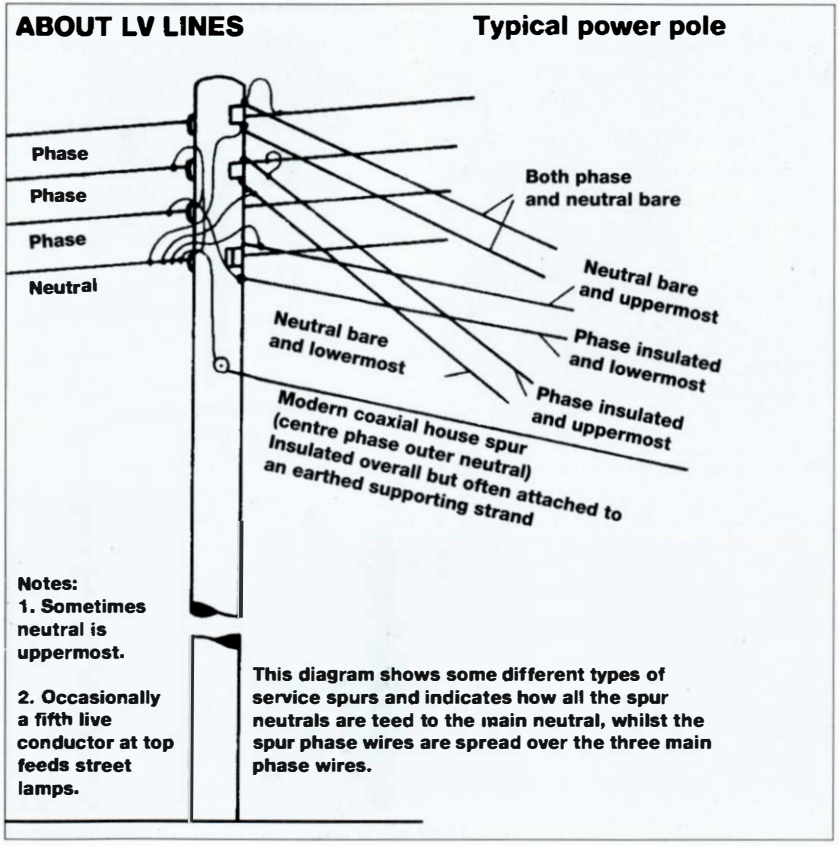
Other points to help you:

- Steel towers mean h.v. – generally 66kV or more.
- Look for the danger notice which every h.v. pole

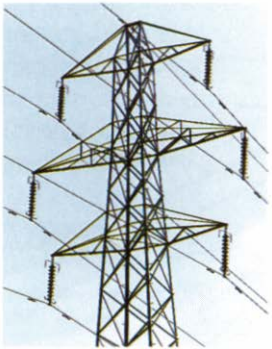
should carry.

- Insulators supporting h.v. conductors are appreciably larger than for l.v.
- Dish-type tension insulators are peculiar to h.v.
- Span lengths greater than 45 metres usually mean h.v., although h.v. spans can be shorter.
- llkV lines use two shed insulators and 33kV lines three shed insulators.

Remember: if in doubt, ask.



Typical HV power lines

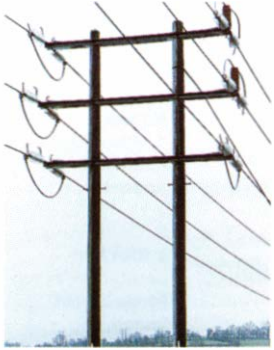


Double Circuit
132V line

Single Circuit 3 phase
33kV line

Tee-off pole, 3 phase
11kV line

11 kV and lv lines



High Voltage systems
come in various forms

Plant clearances at crossings and proximities

Whilst the original construction may have been up to standard, alterations during later years can result in sub-standard situations.

Keep your eyes open for such situations and report any you see.

Inadequate clearances are often the clue and basic information on safety clearances therefore follows as a starting point.

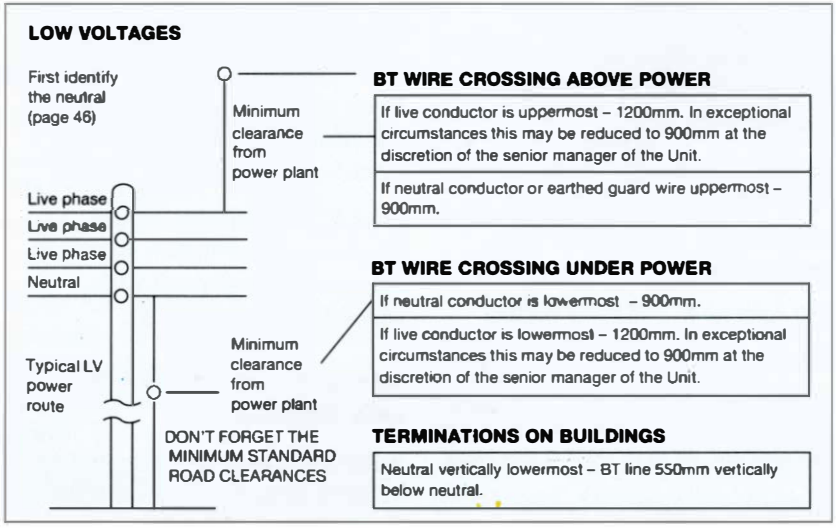
You must consult the relevant instructions for allied details on cable, wire, etc. See EPT/PPS/B035.

High voltages

EPT/PPS/B035 gives detailed plant protection measures in the danger zone. The simplest points are:

- With h.v. power routes of above 33kV, only underground crossings are permissible.
- BT wire must never cross above h.v. power lines or an open air transformer station.
- The minimum permissible clearance is two metres under h.v.

Remember – at 33kV, only Wire C.C. 1.7mm h.v. is permissible but at 6.6kV or llkV, Drop Wire No.8, or No.12 or Aerial Cable Self Supporting Combined may be used.



Keeping your distance

Electricity can jump large gaps so keep ladders, jibs or booms of cranes, pole erection units, elevating platforms, etc. well clear of all electrical equipment, avoiding any possibility of contact with overhead power wires.

Always fully close an aluminium extension ladder before moving it from point to point.

To avoid the danger of flash-over when working near h.v. lines, keep outside these limits with tools and appliances.

650 volts up to 33kV – 2 metres

over 33kV up to 132kV – 2.5 metres

over 133kV up to 275kV – 5 metres

over 275kV up to 400kV – 6 metres

Always use an optical height measuring instrument or clinometer (TMA/TAM/C014) to establish the height of h.v. power wires or power wires which you do not know with absolute certainty to be l.v. You may use Rods, clearance strictly in accordance with TMA/TAM/C014 for l.v. clearances but ***never*** for h.v. and ***never*** attach tapes of any sort to the top of these rods.

Keep well clear of neon signs, television and radio aerials and electrical switch gear.

Joint BT/Electricity Supply Company construction situations are special cases dealt with separately – see page 51.

And some other rules for safe working

• Rods Pruning are designed to be used away from power lines. They are uninsulated and any contact between the rods and power cables could have serious consequences. Do not use them near overhead power distribution. See EPT/OHP/C010.

Never use steel core rope near power lines whatever the voltage.

Do not touch or allow wires or rods to come in contact with a cradle guard under an h.v. line.

Do not run an overhead circuit above or near to a lamp standard.

Be sure you know and follow the clearances, construction methods and regulations, for any wiring job you are given. See page 53 for faults at power crossings.

Be particularly sure you know when the power lines must be made dead before BT overhead work is undertaken. SFY/CSP/A030 and EPT/PPS/B035.

BT plant may be attached to poles carrying l.v. power or up to llkV h.v. power or occasionally both (except in Northern Ireland) – joint construction. Safety is ensured by appropriate plant standards, clearances and working practices. It is important that BT people concerned are able to recognise sub-standard conditions and are conversant with the precautions to be observed.

L.V. Power poles

The basis of the joint construction on low voltage routes is shown on page 52.

H.V. Power poles (up to llkV)

BT attachments are not normally made to Electricity Supply Company h.v. poles.

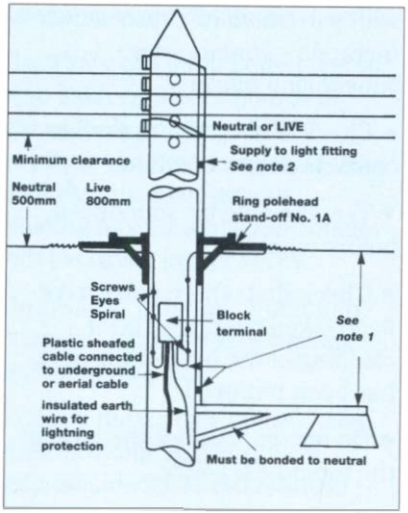
Where permission is given, special conditions apply. Before undertaking any work on a h.v. pole, consult your supervising officer.

Summary of the rules for working on joint user poles

- BT circuits are only attached below the power conductors.
- Give 24 hours notice (one hour in emergency) to the local Electricity Supply Company engineer to work on its h.v. joint user poles.

Note: An emergency refers to the removal of a safety hazard where that hazard is greater than any to be expected in performing the work.

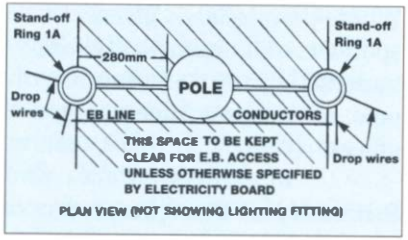
- Do such work only in daylight.
- Do not climb a joint user pole with sub-standard construction methods – contact your supervising officer.
- Check the route for possible contacts before climbing.
- Test the pole for soundness before climbing.
- Check that where poles have been taken over, any metal cladding at the base of the pole has been removed.
- Do not work above the level of the topmost BT wire.
- Ladder must not project above the topmost BT wire.
- Do not leave ladders unattended when erected.
- Do not touch metalwork associated with power equipment or stays.
- Remember that there are



circumstances requiring the power line to be *dead* for erection and recovery of BT plant. See EPT/PPS/B035

Notes:

1. At least 50 mm separation must be maintained between:



a. all BT plant and vertically run power cables.

b. all BT plant and all parts of lamp fittings.

2. Overhead supply to lamps may be PVC insulated and sheathed or concentric neutral cable. Any other cables must be guarded by plastic, metal tube or wooden capping for a distance of not less than 500mm either side of the BT attachments.

The lighting bracket, sensor, any associated metal clad time switch or fuse box and any metal capping or tube must be bonded to the neutral conductor.

3. The distance between the BT earth electrode and the electricity supply earth electrode must be at least 3m.

Power contact emergencies

What do you do where power wires have fallen across BT wires or vice versa?

- Keep clear unless a casualty is in contact.
- Warn the public to keep their distance.
- Stop traffic unless there is ample room.
- Inform the RSC and the electricity supply owner immediately.

What if it an h.v. contact?

You can do nothing, even for a casualty, until the power is cut off – unless you are a h.v. engineer properly equipped for the h.v. involved.

What if it is an l.v. contact?

If possible wait for the power to be cut off but, if any sort of BT wire threatens the public or traffic, and you wear Gloves IR, you can move BT wires, or cut them back which ever is most practical.

Stand on dry insulating material, such as a car mat, if possible.

What if a casualty is in contact with l.v?

Do not touch any wire or the casualty with bare hands, damp gloves or any damp article. Using Gloves IR or insulated tools while standing on insulation try to remove the live wire. Or, using a dry stick, dry rope or dry article of clothing, try to drag wire or person clear.

What about first aid?

Start first aid immediately a casualty is clear – ESG 1 gives details. Seek medically qualified help as soon as possible.

Power contact – further precautions

Report even a suspected power contact to the RSC immediately so that the lines affected can be disconnected at the MDF.

Buildings collapsing or catching fire, burned telephones or continuous bell tinkling are likely indications of power contacts.

When disconnecting lines at an MDF wear Gloves IR and use a suitable extractor. Display a warning notice.

When working on an outside wall close to power wiring which seems in poor condition, do not touch it or any metal parts.

Wear Gloves IR if the wall is wet or if in doubt.

BT faults at h.v. power line crossings

See page 49 for information on underground crossing of h.v. lines. Remember: *never erect temporary overhead wires or cable to restore service if the power line is over 33kV. Do not even run temporary overground wire or cable if the power line 66kV or more.* See EPT/PPS/B035.

Overhead plant on buildings

Working from a roof

The variety of roof situations and the infrequency with which each is encountered make this a risky work area.

Do not attempt to work on any sloping roof without having been trained to do so by having attended a specific training course on such work. Equally, do not work on roofs without the correct equipment such as hooked roof ladders for sloping roofs or crawling boards for flat roofs.

Such equipment is available from the Mechanical Aids Centre or Stores but may only be obtained and used by qualified BT people. Consult your manager if you are in any doubt as to whether or not you are fully trained.

Rig safety lines and use a safety belt wherever possible, and take great care.

A main consideration is not to create any unnecessary new situations requiring roof access to overhead plant.

A second is to ensure that you report existing ones you encounter to the EPMC or RSC for possible re-arrangement and safer access.

Ask about it

Get authority from the owner or occupier before gaining access to any roof.

Do not climb onto a roof until you have assessed it to take into account roof construction, known hazards, any permanent access facilities, customer safety rules, etc.

Where permanent catwalks and ladders are available (eg. in factories) use these and keep to them. Be sure that the facility is serviceable and secured if not, use normal temporary access precautions.

Slippery roofs

Roof areas are prone to algae, frost and other slippery conditions.

Where this may affect your safety, see that it is cleared up or treated before you start work.

Fragile roofs

Do not think that you know best. Pay attention to this warning notice. And bear in mind that many fragile roofs may not be marked or readily identifiable. Never trust asbestos sheeting, whether corrugated or flat, or modern equivalents.

Remember that fragile roofs and glass roof lights can be disguised by water proofing compound or simply dirt. Play safe and treat any sloping roof or domestic lean-to roofs as fragile.

Never walk along the lines of bolts or other fixings on a roof thinking that it will support you. Frequently there will not be a load bearing support underneath. It is also very easy to slip off this line and fall through the roof.

Temporary access

Work on fragile roofs is banned. Where temporary access is required for maintenance of existing plant, a Platform Elevating or other method of access must be used

Some other dos and don'ts

- **Do** take all steps to ensure the safety of the public as and where appropriate.
- **Do** use a strong lifeline.
- **Do** keep tools when not in use in a tool bass or Belts Pocket.
- **Do** keep on the outside of wires which have an angled pull.
- **Do** use two people where it is necessary.
- **Don't** use a skylight frame as a foothold.
- **Don't** use guttering as a handhold or foothold.
- **Don't** move about a steep roof in an upright position – move on hands and knees.
- **Don't** forget to stand clear, during hoisting operations.
- **Don't** jerk or tug if a line fouls roof tiles – ease it clear.

See SFY/CSP/A503.

Work on the face of high buildings

If existing plant at high level is beyond the reach of your ladders or an elevating platform, refer the problem to your supervising officer.

Work on Forestry Commissions watch towers

These are tall structures with cat ladder access and are in relatively inaccessible situations. Work there is subject to additional precautions:

- Where inaccessible to BT vehicles the Commission will provide transport and driver.
- If you are informed that a tower is unsafe, tell your supervising officer and Control so that others may be warned. Don't climb an unsafe tower. If, for any reason, you consider a tower unsafe or you feel unable to climb it, tell your supervising officer.
- Don't climb if you are alone on site.
- Take great care in adverse weather conditions such as ice and gusty winds.

Tree cutting

The use of elevating platforms has made tree cutting activities much safer. However, some tree cutting still takes place on a traditional basis and those doing it must not forget the rules.

- Rest the ladder against the trunk.
- Tie ladder sections at overlapping rungs.
- Lash your ladder bottom and top.
- Don't rely on small branches for support.
- Watch for brittle or decayed branches.
- Use your safety belt where practicable.
- Support large branches with rope before cutting. Lower cut branches under control. Be careful that cutting away of branches does not disturb your security. Use long-armed lopping shears for side shoots and undergrowth.
- Pruning rods are uninsulated and must not be used near overhead power distribution. See EPT/OHP/C010.
- Chain saws may only be used after you have been trained, and only electric chain saws may be used in elevating platforms. Chain

saws must not not be used in trees or when working from ladders. ISIS document TMA/MAG/D023.

• Do not cut the branch the ladder is resting on.

Safe use of elevating platforms

General

Elevating platforms are a boon to safe access aloft but their use is subject to a number of restrictions and precautions. This is because of risk of serious accident by overturning, boom striking an overhead obstruction or traffic colliding with a projecting boom.

Always wear a safety belt when using an elevating platform. The correct belt is the Belt Safety No.9 and is generally issued on a personal basis. Care for it as with other safety belts.

Training

Only people who have attended an appropriate training course are allowed to operate the hydraulic platform.

Travelling to and from site

Before moving off, be absolutely sure that the boom is correctly stowed and that stabilisers or spring lockouts are in the 'un-operated' position.

Give some careful thought to your route, low bridges and other overhead obstructions for example. Check that the tyres are fully inflated.

Preparatory work at site

Switch on your amber rotating beacon and set up the necessary roadworks guarding. Assess the site-slopes, road camber, type of ground etc. Check for adjacent overhead power wires.

Work from a static position

- Site the vehicle on firm, level ground where possible. Allow for keeping the boom within the width of the vehicle as far as possible.
- On sloping ground (except road cambers) face the vehicle downhill with wheels chocked securely.
- Check handbrake or automatic brake lock is fully on. Operate spring lockouts and stabilisers. Use load spreaders if necessary.

• A second person (known as a Ground Support Person) must remain in close proximity to the vehicle at all times. Their only duty is to summon assistance, if required, from the emergency services. *Under no circumstances must they operate the platform controls.*

Driving with a person aloft

Travelling with anyone in the cage is permissible only with Platforms Elevating Nos.3, 4 and Aerial Cabling Unit and then only at a height necessary to carry out the job in hand and subject to these conditions:

• across firm ground only;

• never across sloping ground (road camber excepted);

• rear spring lockouts operated;

• maximum speed five miles per hour;

• cage within the width of vehicle before moving off;

• intercom system functioning properly.

Miscellaneous precautions

• Do not use a ladder, steps, etc. within the cage to gain additional height or reach.

• Do not use a drop wire dispenser in the cage.

• Do not leave tools or rubbish underfoot.

• Use a safety belt at all times.

• Wear your safety helmet and other personal protective equipment as required.

See SFY/CSP/D015 and EPT/OHP/B012.

• Do not use the platform or boom to support any outside load, for example do not use it to support dropwires during DP renewals.

Removal and replacement of jointing chamber covers

Because covers are typically large and heavy, and because, of course, they are beneath your feet, failure to use correct equipment and practices for cover removal and replacement can have painful and lasting results. For your own sake, and for the sake of your colleagues, do take note of the following:

• Make sure you are trained in the correct procedures for removal and replacement of covers. All standard procedures and associated equipment are illustrated and described in EPT/UGP/B013 for carriageway covers and EPT/UGP/B009 for other types.

• Remember your gas precautions.

• Use your manhole cover lifter where appropriate. Particularly for carriageway grade covers, use of the Lifter, Manhole Cover 4A should be the normal procedure.

• For both mechanical and manual procedures, use the correct keys and ensure they are properly located.

• Remove any holding-down bolts before lifting a cover.

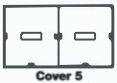
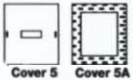
• Never try to loosen a cover by any means which involves naked flames or by using hammers, picks, or any other tool which may cause sparks. Where ice is the problem you must thaw the ice by using a solution of hot water and salt, or de-icing solution. For tight-fitting carriageway covers, Lifter, Manhole Cover 1 should be available.

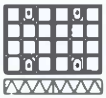
• After a cover has been removed, lower it to the ground.

• Take care on sloping ground.

• Modern double-triangular type carriageway covers may be pinned together in pairs. *Do not* remove cover-connecting pins to aid handling. Where covers are pinned together a minimum of four persons will be needed to remove the covers safely by manual methods.

• Footway covers, driveway

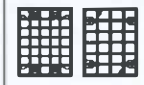
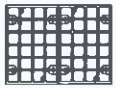
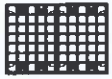
Covers	Type No.	Removal
	21	Key Joint Box No. 3
	22	
	23	Key Joint Box No. 2
	JF1 JRF1 JUF2 JBF2 JF3 JRF3 JUF4 JBF4 JRC4 JBC4	Key Joint Box No. 2 or Key Joint Box No.4 Wooden Block and Roller
		
	JUF6 JBF6 JUF9 JBF9	
	JF5 JRF5	
	JRF10 JUF10 JBF10	
	JRF11 JUF11 JBF11	

Covers	Type No.	Removal
	6A	Lifter 4A and Two Parts 5B
	Type E	Lifter 4A and Two Parts 1A
	3 to 7	Lifter 4A and Two Parts 4A
	Cover Pit No. 2	
	Wood Type	

Covers	Type No.	Removal
	1 1A	Lifter 4A and Two Part 3B
	2 2A	
	3 3A	
	1C	Lifter 4A and Two Parts 3B or 4 Men Lift
	2C	
	3C	
	1D	
	2D	
	3D	

A. MARKED HD (HEAVY DUTY
C. HEAVY DUTY CURRENT DESIGN WITH CONNECTING PINS
D. NEW STYLE WITH CONNECTING PINS

DO NOT REMOVE THESE COVERS

Covers	Type No.	Removal
	Unit Type	NOTE: HEAVY COVERS USE LIFTER 4A AND TWO PARTS 2A
	Unit A Single Unit B Ends	
	Unit C Intermediate	NOTE: HEAVY COVERS USE LIFTER 4A AND TWO PARTS 5B
	JRC11 JUC11 JBC11 JRC14 JUF 14 JBC14	
		

covers and covers with special finishes for use in pedestrian precincts can generally be removed and replaced manually by one person. Where necessary, two people may be required. In addition to the use of Lifter, Manhole Cover 4A both manual methods utilising Keys Joint Box 2 or Keys Joint Box 4 are fully described and illustrated in EPT/UGP/B009.

Remember – start by freeing each cover to be removed using the reversed-key action.

Gas testing

Every underground party must have the appropriate gas testing equipment. They can also have the additional safeguard of a portable gas monitor where necessary. Each individual concerned must have a personal copy of ESG 4 – the gas precautions handbook – and be trained in the correct use of the equipment.

If you are issued with gas testing equipment, it is your responsibility to ensure that it is kept in good order. It is the user's responsibility to make the necessary checks each time before use.

Do not use faulty equipment. Get it changed or repaired promptly.

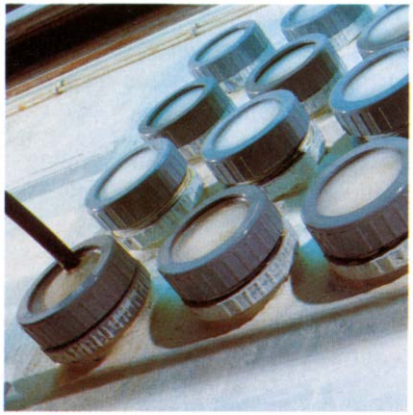
ESG 4 guides you on the various test procedures involved and on the actions to be taken in the event of the tests proving positive.

If you are a Contract Supervising Officer (CSO) Clerk of Works (CoW) or a Housing Estates Liaison Officer (HELO) then there are additional responsibilities regarding contractors and their staff.

Prior to the start of any contract where gas testing is required, the contractor's arrangements for gas testing should be made known to all BT people who will be supervising the works. Because of the wide variation of equipment in use by contractors, it is essential that these supervisors are familiarised with the principles of how this equipment functions. During the progress of the contract the BT Supervisor should note any gas test that they see being performed by the contractor and record this in the relevant contract documents. Any failure by the contractor to carry out necessary gas testing must also be recorded and the matter brought to the attention of the contractor or agent. BT people should not carry out gas testing for the contractor or rely on the results of a contractor's tests as proving the area safe for them. A separate test must be made prior to any BT people entering the area.

Duct seals

Before disturbing any duct seal test for gas, see ESG 4. Be sure to notify the Officer in Charge (OiC) of the building to ensure that a temporary or permanent gas monitor is operating all the time a seal is open. Even with the monitor functioning never leave a duct unsealed and unattended – even for short breaks in work. Re-seal it temporarily or permanently at the end of every working period.



In and out safely

Always use the ladder or steps provided. Do not stand or climb on cable bearers. If it is necessary to move a manhole access ladder, lash it in a temporary vertical position in the shaft for emergencies. Where exceptionally, it is removed entirely and someone is below, an alternative ladder must be on hand by the entry to the manhole.

Conditions for BT people being in a manhole.

When BT people are in a manhole, there must be a surface attendant to make checks that all is well below. When gas tests prove negative in a single tier manhole, the surface attendant may co-operate underground for very short periods of time. For example, during setting up and clearing down.

If contact is lost.

If you, as the surface attendant, discover all is not well with the person underground, your precise actions will depend on the immediate circumstances. The ruling principle is that you must not end up as a second casualty with no one else to help. If, for any reason, you suspect there may be either flammable or asphyxiating gas, notify the emergency services immediately and take the usual measures (see ESG4) against possible ignition of gas. Should it be obvious that the problem below ground is caused by something other than gas, try to identify the cause before entering to help the person. Never remain below longer than absolutely vital. If the person below appears to have completely collapsed, you must call out the fire brigade to effect a rescue. Also, call for an ambulance.

Of course, if your colleague appears to be struggling to climb out, and you can help them from the top with a line or a strong arm, do so at once.

Remember you are there to get help for your colleague – not to become the next casualty.

Untrained people have died trying to help in such circumstances.

Call the fire and ambulance services quickly if needed.

Tell your manager what has happened as soon as possible.

Inspection on entry

When entering a jointing chamber look out for hazards. Anything affecting safety *must be*

reported using the form A1024.

Here are some things to look for:

- Are frames and covers sound?
- Do covers rock?
- Are the keyholes worn?
- Are steps and ladders sound, adequate and free from serious corrosion?
- Are frames and covers reasonably level with the footway/carriageway?
- Are duct seals sound and bores correctly sealed?
- Are sump gratings whole and properly located?
- Does plant, cable, etc. present a hazard to entry, exit or access for working?
- Are there any cracks, bulges or serious deterioration of the fabric?

Rats

Keep a look out for evidence of rats especially where demolition or sewer work is in progress near by. Droppings, gnawed cable or duct seals, greasy smears on walls a few inches above pipes or cables, nests, etc. are all tell tale signs. Report any such evidence to your supervising officer promptly and take these precautions when working in a suspect area.

- Maintain all hygiene precaution with care.
- Make sure that when washing your hands you pay particular care in cleaning around your finger nails, use a nailbrush where possible.
- Wash down waterproof clothing and footwear after working there.
- Search for and seal any obvious entry points into underground plant, eg. unsealed duct entries to derelict buildings, broken ducts or manhole covers.
- Obtain treatment from the emergency department of the nearest hospital for even minor scratches. Tell them that the area in which you were working was rat infested and show them the HSE advice card given to you by your manager.

It is quite common for the

hospital to ask for a blood test in these circumstances. The test is known as the 'ELISA' blood test and is a very simple test to administer.

Rat bait

You may come across rat bait at some time. Warfarin, is the most commonly used and contains an indicator dye which turns blue when wet. It is often mixed with bran or oatmeal as bait. This mixture is harmless to humans unless eaten in large quantities. If other dangerous rat baits are used, the rodent exterminator should display a warning notice. Avoid unnecessary contact with rat bait but if handling is necessary wear Gloves PVC No.2 and wash both your hands and gloves after use.

Weil's disease

Weil's disease, or Leptospirosis, is the main hazard from rat infestation. It is a bacterial infection carried in rat and other animals urine which contaminates any water it comes in contact with. It causes an influenza like illness which may also be combined with a high temperature and joint or muscular pains. Weil's disease is a serious illness which requires hospital treatment. People most at risk from this illness are farmers and agricultural workers although those in frequent contact with river and lake water, anglers, water skiers and surf boarders for example are equally at risk. The bacteria enters the body through absorption by the skin and mucous membranes of the eyes and throat. Any open cut or abrasion of the skin makes it easier for the bacteria to gain entry to the blood stream.

The best precautions against contracting Weil's disease are those of basic hygiene, the following list of points will enable you to avoid this disease:

- Wherever possible, pump out and clean any suspected manhole or jointing chamber.
- Avoid contact with the water from the manhole, etc.
- Wear waterproof clothing wherever practical and wash it as soon as possible after use.

• Always use waterproof gloves and boots.

• Make sure that any cuts or abrasions are securely covered by a waterproof dressing.

• Avoid touching your mouth or face with your hands if they have come into contact with the water.

• Don't eat, drink, smoke or apply make up until you have thoroughly washed your face and hands with soap and water.

• Finally, if you feel unwell after being in a contaminated place, especially with a flu-like illness up to three weeks later, see your GP without delay and tell the doctor that you have been in a rat infested place.

Remember Good personal hygiene is the best precaution

Hypodermic needles

Isolated incidents have occurred where used hypodermic needles and syringes have been found in BT manholes. It is extremely probable that these have been used by drug addicts who may have unpleasant communicable diseases such as AIDS or Hepatitis B. Because of the implications that an accidental stab wound from such a needle could have, special precautions must be taken when disposing of them.

No attempt should be made to replace any guard on the needle. The needles should be picked up using pliers and placed in a suitably marked tin or other container. The container should then be sent to the local OHS for disposal, and the pliers sterilised by holding them in a blowlamp flame for about a minute. Care should be taken when cleaning out the keyholes of the cover prior to opening the jointing chamber, use a screwdriver or similar tool, ***never*** use your fingers.

Coaxial power

Where a cable containing coaxial pairs has to be opened, the safety procedures in EPT/CFE/C010, and any other procedures laid down for that particular route, must be observed. ISIS document EPT/PPS/A022 deals with the 60MHz route.

Repeater cases

Always release pressure before attempting to remove the cover of a repeater case.

Pumping out

Do not pump waste water on to a footway or roadway. The danger is obvious and particularly acute in icy or wintry weather. Run the outlet hose to the nearest drain or ditch. Where water is allowed to flow along the kerb side, be sure to check that there are no intervening gaps in the kerb to let water flow over the footway or to enter roadside premises.

Your comfort

The confines of a jointing chamber require a little effort on your part to avoid the aches and pains which can follow working in awkward and possibly damp situations.

Here are a few tips:

- Before starting work, clean and dry out the jointing chamber.
- Drape any damp wall area adjacent to the work area with waterproof sheets.
- Try to avoid working in a cramped, uncomfortable position especially in a stooping-back posture.
- Try to achieve a position that allows free leg and arm movement.
- If you are in any discomfort, change positions frequently or take short breaks.

Power for appliances

You must never take mains voltage power to a construction site or into a jointing chamber to power portable appliances.

If using a mains power source (eg. to avoid noise problems) use a Transformer Tool Electric to step down the voltage.

Use a 24V battery or generator to supply lighting or small appliances. Use a 110V generator to supply larger power requirements.

Be sure to keep leads in good repair and position them so as to avoid creating a tripping hazard.

To aid blind or partially sighted people, keep all equipment in a clearly defined and guarded area.

The right match of rope to pulling gear

Cabling ropes may stretch unduly, break or jam if used wrongly. You must be sure that the right rope is matched to the pulling equipment and used only for its specified application. To help you the table below provides a brief reminder, but refer to the Cabling Handbook (EPT/UGP/E031) for details.

Never use cabling ropes for lifting and never use lifting ropes (or lifting gear) for cabling. Any equipment with a full or partial coating of fluorescent light red paint, or obtained on signature from a Mechanical Aids Centre (Lifting Equipment Section) is certain to be lifting gear.

Never use a vehicle to pull a cable into or out of a duct. It is an extremely dangerous practice and can lead to serious injury or death not only to the operators but to members of the public as well. Severe damage can also result to the vehicle.

Checks at depot

Before setting out:

- Check all equipment for damage.
- Check ropes for undue wear, kinks etc.

TYPE OF ROPE	USAGE	PULLING EQUIPMENT	TYPE OF ROPE
DRAW ROPE No. 1 (Polypropylene)	Light cable pulling. Drawing in cabling ropes	Self-reeling winches eg R & LC Unit, LC & JV; Medium cabling unit	The only rope to be pulled by winch, cabling lightweight.
ROPE CABLING No. 1 (Prestretched Terylene 3 Strand)	Light cable pulling. Drawing in other cabling ropes	R and LC vehicles; LC & JV Heavy Cabling Equipment; Self-reeling winches and medium cabling unit	NEVER use on hand tailed winches.
ROPE CABLING No. 4 (Kevlar)	General cable pulling	Trailer, Motor Winch; Mech. Cabling end GP vehicles (Mk 1); Open capstan type winches; Medium cabling unit	Only cabling used on capstan type hand tailed winches
ROPE CABLING No. 9	Drawing in cable in mono bore sub-duct General light cabling work	Any self tailing self reelingwinch	MUST NOT be used on hand tailed winches
STEEL WIRE ROPE	General cable pulling	Winch, Mobile No. 1; Ceble Pulling Unit; Mech. cabling and GP vehicles (Mk 11); Captive rope winches	Rope replacement must be carried out by MT staff
ROPE CABLE RECOVERY	Cable Recovery	Trailer, Cable Racovery	Use only Rope Ceble. Recovery with this trailer

• Check engine controls and emergency stop on winches.

• Check radio equipment is functioning.

Good communications

Where radio equipment is provided for communication between pulling and feeding ends, be sure you know how to use it properly and to the best advantage.

Checks at site

When a winch is in position and correctly restrained, double check the emergency stop.

The drum end

A drum mounted on a correct trailer is the most stable and safest arrangement. A Cable Drum Trailer No.2 or 2A with safety cage may be left unattended. Other than that there must be an attendant at the drum end during pulling.

A jack mounted drum needs special care in setting up and a reduced pulling speed is required.

The pulling end

Keep clear of ropes under tension. *People must never be in a jointing chamber where ropes or chains are under tension by a powered winch.*

Ensure that colleagues and the public are clear of possible flailing ends. Use the appropriate rope guiding/guarding equipment. Use guards to keep others at a safe distance not only from ropes but from revolving capstans or drums. See ISIS document EPT/UGP/E031 – Cabling in Duct Handbook.

When applying back tension never wind a rope around a hand or any part of the body: You must be able to release the rope quickly. Never try to free a jammed rope while the winch is under load.

Except with self-reeling winches, a second person is required to deal with discarded rope and to prevent distractions to the operator. But they must not approach closer than one metre to the capstan or a jointing chamber entrance.

Always stand outside the bight of slack ropes or cables.

Blown fibres

Blown fibre is the term used to describe the method of installing optical fibre 'units' or 'bundles' into previously installed polyethylene tubing. Distances up to 600 metres can be blown in a single operation but it is possible to install much greater lengths by using 'range extending' techniques. See the Blown Fibre Handbooks – ISIS documents EPT/COF/B015 and EPT/COF/B017.

You must have attended the relevant training courses before using the equipment.

Use only the petrol or diesel engine driven compressors and ensure there is adequate ventilation for exhaust fumes. Do not use any compressor operated directly from the mains supply – they are for use in dry conditions only. Compressors operating at 110 volts may be used in any normal working environment.

Ensure the site is properly guarded, perform the standard gas tests and set up the cabling radio system. Use the extension aerials if necessary.

When unpacking fibre from the plastic pans, beware the sharp pointed teeth on packing flanges.

Beware the dangers of compressed air (see page 6.)

General advice on safe lifting and handling is given on page 21 and in ESG 1.

An important rule is to use approved mechanical aids wherever possible for heavy work. Several circumstances particular to underground work are underlined here:

Frames and covers

Use the appropriate slings with cranes, lorry loader, or fork lift trucks where appropriate to handle frames and covers. See page 60 for information on removing and replacing covers in frames that are in situ.

Loading coil cases and repeater cases

Such heavy items should be lifted into position by crane. To lift cases, slings or Harness Loading Coil Case 1A must be used. Lifting eyes must not be relied on as they may be corroded and unsafe. See EPT/UGP/E015.

Air cylinders

Use the trolley shown here. It is designed for easy loading and unloading in and out of vehicles and so that two people can carry it bodily across rough ground. And, if a cylinder has to be lowered into a manhole, use a Hoist Underground Structures. See TMA/APN/A038.

If you regularly carry large quantities of gas cylinders, either propane or compressed air, special regulations may apply to your activities. In such situations, advice will be available either from Motor Transport Advisers or your manager.

Fire risk on underground sites

There is a greater fire risk than normal on underground work sites and a number of precautions are set out in ESG 1 and ESG 4 which must be emphasised here.

Don'ts with naked flames

- *Don't* take a naked flame within 4 metres of an open underground chamber, open cabinet or open pillar, until proved free of gas.
- *Don't* try to free a frozen cover using a blow torch.

- *Don't* have any lighted portable appliance in a vehicle unless expressly approved or installed for the purpose by BT.
- *Don't* try unfreezing a pump or petrol engine driven equipment with a naked flame. Use hot cloths.

Care with petrol engined equipment

- Re-fuel in the open air, never in a vehicle and wait until the aid is cool.
- Use a funnel with the petrol can in contact if it is a metal funnel. This will reduce the risk of a static spark igniting the petrol.
- Do not have a naked flame, running engine or running compressor nearby.
- Ensure that there is nothing that can cause a spark or flame in the area.
- Do not site the equipment against a jointer's tent.

Care with propane

- Ensure all connections are good.
- In sub-zero temperatures, check hoses frequently for cracks and splits.
- Never take a propane appliance underground until actually required for use.
- *Never* leave it there unattended and that includes meal breaks.

Remove it immediately after use.

• If the appliance goes out underground *do not re-light it* until the work-place has been proved clear of gas,

And a few general reminders

Rags impregnated with oil or flammable liquid are a very real fire risk. If you cannot remove them promptly to a safe place in the open air, put them in a closed metal container before you dispose of them properly.

Be sure you know the rules for handling flammable and highly flammable liquids (ESG l). Take care not to accumulate material that will ignite easily and don't discard lighted matches or cigarette ends in the work area.

Don't forget that there are special rules for vehicles on airfields and near aviation fuel depots – see EPT/UGP/B070.

Snap on covers...

for block terminals are not meant to be removed by brute force – especially if you are on a ladder. Ease the cover free as shown here. Press with the thumbs in the centre near the top and hook your fingers under the cover lip at each side.

Chain Saws...

have the potential to inflict severe injury if misused. You must be trained and qualified to use one and you must wear the correct clothing. Petrol engine driven chain saws are for work at ground level only. Electric powered chain saws are for use in elevating platforms and for limited work at ground level. See ISIS document TMA/MAG/D023.

Pipe cutters...

use abrasive discs and are regarded as coming under the Abrasive Wheels Regulations SFY/LAP/D037. Remember. . . You must be authorised, trained and qualified to use one. . . you must dress appropriately (nothing loose to catch in machinery), wear eye shields and a dust respirator.

Acoustic shock

In no circumstances connect Oscillator No.99A or Locator No.9A Transmitter across a pair of wires in a cable or to a single wire. The high level of sound is a risk to anyone listening on that circuit. The correct method of operation is shown in EPT/PPS/D010. When using any form of oscillator or amplifier on cable pairs, ensure that only the correct techniques as detailed in the ISIS documents are used.

Exhaust fumes from mechanical aids

Position engine-driven equipment so that exhaust fumes do not enter an open jointing chamber or similar areas. Use extension exhausts if necessary. Do not operate such equipment in the back of vehicles but only in the open air.

Tools and equipment

Remember, most tools and equipment must undergo periodic inspection, test and maintenance. See ISIS Directive SFY/CSP/A021.

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