REPORT TO: **POLICY AND RESOURCES COMMITTEE 9 FEBRUARY 2009.**

REPORT ON: **CORPORATE BUSINESS CONTINUITY PLAN**

REPORT BY: **HEAD OF FINANCE**

REPORT NO: **88-2009**

1   **PURPOSE OF REPORT**

This report provides Elected Members with a copy of the Council's Corporate Business Continuity Plan

2   **RECOMMENDATIONS**

It is recommended the Committee:

Approves the Corporate Business Continuity Plan.

3   **FINANCIAL IMPLICATIONS**

There are no immediate financial implications from the content of this report as the costs of compliance, should the plan be invoked, would be contained within Departmental budgets.

4   **MAIN TEXT**

4.1   The Civil contingencies Act 2004 imposed duties upon Local Authorities to be able to continue to provide critical services in the event of a defined emergency which has an impact on a significant number of members of its community.

4.2   There is no specific duty to have a Business Continuity Plan, but it is very much recognised as good business practice to have such a document.

4.3   There is an obvious relationship between this plan and the Council Emergency Plan. In recognition of this the Business Continuity Plan has been discussed with the Council's Emergency Planning Officer to ensure there are no inconsistencies between the two sets of arrangements.

5   **POLICY IMPLICATIONS**

5.1   This report has been screened for any policy implications in respect of Sustainability, Strategic Environmental Assessment, Anti-Poverty, Equality Impact Assessment and Risk Management.

5.2   The subject matter of this report is concerned with one aspect of the Council's overall Risk Management strategy, namely the ability to continue to deliver services and recover from the disruptive effects of an emergency situation.

6　**CONSULTATIONS**

The Chief Executive, Depute Chief Executive (Support Services), Depute Chief Executive (Finance) and Head of Finance have been consulted on the content of this report.

7　**BACKGROUND PAPERS**

None.

MARJORY M STEWART
HEAD OF FINANCE　　　**03 FEBRUARY 2009**

DUNDEE CITY COUNCIL
HIGH LEVEL
BUSINESS CONTINUITY PLAN

FOREWORD
Alex Stephen
Chief Executive

All of us who work for the City Council need to be aware of the consequences of large-scale damage and disruption to our premises or large scale unavailability of staff due to an event like pandemic flu and the subsequent effect upon the services that we provide. If the worst should occur we must be able to respond in a controlled, professional and prompt manner.

This plan will enable us to do that. It is the main Business Continuity plan for the City Council. Each department will produce its own business continuity plan which will specifically be concerned with the maintenance of their critical services.

Please consider your role in the plan and retain it for possible use in the future.

Alex Stephen

Chief Executive
Dundee City Council

CONTENTS

1.   INTRODUCTION

1.1 Nearly every day there are many unpublicised disasters, man-made and natural, which devastate both private and public sector's ability to deliver services. Where the disruption affects critical service procedures, the consequences can be severe and include substantial financial loss, an inability to achieve levels of service we have committed ourselves to deliver, embarrassment and loss of credibility or goodwill for the organisation concerned. The consequential damage can have a much wider impact on staff welfare and the general public. The benefit therefore of having a recovery plan that can be implemented with the minimum delay, is that it reduces the level of disruption to Dundee City Council and should ensure the rapid resumption of services to the public.

1.2 This plan outlines the actions required by the Chief Officers Management Team (COMT) assisted by selected staff. However, each department should have their own plan. The department plans should cover all critical aspects of their own service delivery.

2. AIM

2.1 The aim of this plan is to ensure that critical functions are reinstated as soon as possible, ensuring an unbroken level of front line services whilst full restoration is planned for and implemented.

3. OBJECTIVES

- To mobilise the structure required to manage the recovery.

- To list the immediate action to be taken.

- To list the short term measures necessary to replicate essential systems.

- To list the medium term measures necessary to build up towards recovery.

- To describe longer term recovery action.

4. PLAN ASSUMPTIONS

4.1 The plan assumes a worst-case scenario in which critical information systems and resources are destroyed by fire/other natural events, or significant numbers of staff are unavailable that prevents key service delivery functions being undertaken.

4.2 It is expected that the Council's policies as they apply to records management, file management, computer security in general and virus protection in particular, is being applied in departments. Similarly, it is also expected that fire prevention, physical security and health and safety at work standards are also being applied consistently by departments.

4.3 The business continuity planning process also requires inventories of hard/software, other business systems and major items of equipment to be maintained by departments.

5. USE OF THE PLAN

5.1 This plan is designed to be used by all staff involved in the recovery process and in particular, Recovery Teams from the various departments. The plan outlines the recovery process.

6. RECOVERY STRATEGY - ACCOMMODATION

6.1 Wherever possible, Dundee City Council premises will be used to locate critical business functions. Areas that are not normally staffed will be used eg canteen, training, conference and committee room facilities. An element of disruption over protracted periods may well have to be accepted by all parties.

6.2 The displacement of non-critical functions, or functions that can be re-sited with little impact, will be carried out to provide accommodation for critical business functions.

6.3 In the event of serious extensive damage to City Council property, it may become necessary to relocate entirely to another premises owned by the Council. If necessary further property may be leased on a short term basis until such time as full replacement or refurbishment has taken place in the damaged premises. The provision of portakabins will also be considered as a possible option.

7. IT ARRANGEMENTS

7.1 **The Computer Room**

The current DCC IT Disaster Recovery Plan is based around the recovery of the Computer Rooms in Tayside House and the City Square complex. A separate IT recovery plan exists.

The Computer Rooms have full emergency power, fire, flood and intruder detection which are regularly tested.

8. ORGANISATION

8.1 In the event of a major incident resulting in the loss of all or some of the Council's critical functions, the Emergency Management Team (EMT) will assemble in accordance with the Council Generic Emergency Plan, accompanied by departmental representatives as appropriate, affected by the incident. The EMT will remain in operation for the duration of the emergency situation.

8.2 All personnel should be aware that in all probability unless it is only a single Council building that is affected, the EMT will not only be concerned with the continuity of Council services but also involved in a full scale response and recovery operation dealing with the wider consequences to the community as part of the Tayside Strategic Coordinating Group. It is therefore critical that team leaders responsible for delivering services are fully aware of their business continuity arrangements.

8.2 The EMT will have full authority to declare a disaster situation and have the authority to decide which elements of the recovery plan should be invoked. The EMT will be responsible for the overall management, co-ordination, control and monitoring of the situation as it applies to the Council and for the recovery actions outlined within the Business Continuity Plan.

9. STRUCTURE

9.1 **Emergency Management Team**

Chief Executive (Team Leader)
Depute Chief Executive (Finance)
Depute Chief Executive (Support Services)
Assistant Chief Executive

Director of Leisure and Communities
Director of Contract Services
Director of Economic Development
Director of Education
Director of Housing
Head of Personnel
Head of Information Technology
Director of Planning and Transportation
Head of Finance
Director of Social Work
Head of Public Relations
Emergency Planning Officer
Risk and Business Continuity Manager
Health and Safety Manager

10. EMT RESPONSIBILITIES

- Evaluating the extent of the damage and the potential consequences.

- Implementing measures to prevent loss or damage to life, property and resources and making the site secure and safe.

- Authorising recovery procedures in order to maintain an operational service to staff and clients.

- Disseminating information to the public through media.

- Providing authority for the ordering and acquiring of replacement equipment.

- Monitoring expenditure arising out of recovery operations.

- Organising the return to normality once the emergency period has passed.

Specific Recovery Tasks

<u>Head of IT</u>
Organises the implementation of replacement of hard/software and communications links.

<u>Director of Economic Development</u>
Organises salvage, site security and the acquisition of alternative accommodation.

Risk and Business Continuity Manager
Co-ordinates the replacement of damaged equipment and supplies.

Head of Public Relations
Issued public announcements and keeps City Council staff informed.

Health and Safety Manager
Initiation of legal compliance and risk assessment.

Emergency Planning Officer
Establish and maintain operations area for the EMT. Liaise with uniformed personnel and voluntary sectors.

<u>Departmental Co-ordinators</u>
Assess impact on service delivery and prioritise replication requirements. Control of nominated department and section staff for recovery duties.

11.   PLAN ACTIVATION

The activation of the business continuity plan is broken down into three phases:

- Initial activation
- The evaluation phase
- Full activation

11.1   Initial Activation

Out of hours the plan will be activated by the EMT Leader on receipt of information from the Emergency Planning Officer or any other possible source (Police, media etc).

During office hours normal emergency procedures will be followed and the immediate situation managed by the Departmental Manager affected. He/she will then contact the Emergency Management Team leader.

Contact phone numbers for all EMT members and selected staff within DCC are contained in the DCC Emergency Contact Directory within the Council's Generic Emergency Plan. Contact details for department staff should be included in the main department plans.

<u>Evaluation Phase</u>
If not already on site the EMT leader contacted will make his/her way to the scene in order to make an initial evaluation of the extent of the damage/disruption. The other members of the EMT will be placed on standby at this stage. Depending on the level of damage, the EMT leader will either take no further action or will initiate full activation.

11.2   Full Activation

- If the plan is fully activated the EMT leader will carry out the following actions:

- Instruct the EMT to RV at the Council Emergency Centre or other nominated location or alternative location.

- Instruct one of the EMT members to contact the department heads affected and move to the site.

- Open a log of events.

- In conjunction with the Head of Public Relations and Tayside Police start preparing update briefings/warnings for staff, members of the public and the media.

- All EMT members will alert and deploy the supporting members of their respective departments in accordance with their respective Business Continuity Plans.

11.3 **Action Checklists**

EMT checklists are shown as follows:

• Immediate action	Annex A
• Action taken during next three hours	Annex A - 1
• Action taken during next twenty-four hours	Annex A - 2
• Action taken during the next month	Annex A - 3
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12. STAFF AND PUBLIC ANNOUNCEMENTS

12.1 Under the direction of the Head of Public Relations the City Council Public Relations Department will be responsible for keeping staff and the public informed throughout the recovery period. The PR Department will use the media, website and any other appropriate communications channel to:

- Tell all City Council staff what further action they need to take in accordance with their response team allocation. A sample message for staff is shown at Annex A - 3.

- Keep members of the public informed about the effect the incident will have on services.

12.2 Departmental Management Teams will be responsible for passing information they wish to be communicated to their staff and the public relative to their service continuity arrangements.

13. DEPARTMENTAL RESOURCE REQUIREMENTS

13.1 Departmental functions have been categorised in Departmental Business Continuity Plans against the following list of priorities:

- essential core business and supporting functions needing to be restored in the shortest possible time.

- important core business and supporting functions needing to be restored within an established time frame.

- loss which would have no immediate impact on the department's service delivery but which needs to be restored in the longer term.

14. SUPPORTING INSTRUCTIONS

The following general guidelines will apply:

14.1 **Authorised Expenditure**

The Head of Finance will authorise any expenditure needed for the prevention of further loss of life or injury, or loss or damage to property and assets and authorise the expenditure necessary for making sites secure and safe. Any other discretionary expenditure such as leasing offices or the replacement of high value assets would have to be referred to the EMT.

Records of expenditure relating to the incident should be kept using the format contained at Annex B to this plan.

14.2 **Cash**

Although the normal procedures of official orders, invoicing and creditor payments should apply, where immediate or cash payments are required, these can be arranged through the Head of Finance.

14.3 **Insurance**

Before ordering the repayment of high value assets the Risk Management Section should first be consulted in order to clarify the terms of existing cover.

15. SALVAGE

15.1 In the immediate aftermath of a serious incident there will be a requirement to initiate salvage operations and the repair of items contained in the damaged area. An inventory of usable equipment, furnishings, documents and supplies, will need to be compiled. Departmental heads will therefore need to nominate staff who can work alongside professional salvors.

15.2 Important salvage information is contained in the following annexes:

• Main problems/safety	Annex C
• Damaged documents	Annex C - 1
• Damaged computer and communications equipment	Annex C - 2

16. FLOOR PLANS

Detailed floor plans for all major City Council premises are available from the Director of Economic Development via the Council's GVA system.

17. ALTERNATE LOCATIONS

All requests for alternate locations will be remitted to the Director of Economic Development who will co-ordinate activity in this area.

18. RESOURCE LISTS

Departments are responsible for identifying their own specialist resource requirements and including the information in their respective department plans.

1   Depending on the information received, the Emergency Management Team Leader will arrange for the following actions to be taken:

       a   Place other members of the team on standby and/or instruct them to move to the Council's Emergency Centre.

       b   Move to the site and make an assessment of damage done and site security.

       c   Open a log of events.

       d   Make a preliminary (verbal) report to the senior management of Departments.

2   Team members will alert and deploy other members of their functional groups, as necessary.

3   The Team Leader will call for an initial meeting of the EMT with the following objectives:

       a   To define the problem, the extent of disruption, its consequences and the probable implications for the foreseeable future.

       b   To select a specified location as an operations centre.

       c   To agree each team member's objectives for the following three hours.

       d   To set up a second meeting for three hours later.

4   The Team Leader will then make a second, more detailed report to senior management and Elected Members on actions being taken, future intentions and help required.

ANNEX A-1   EMT - ACTION TAKEN DURING NEXT THREE HOURS

		Lead
1.	Establish the operations centre either on or off site	Chief Executive (Team Leader)
2.	Use the Centre as the main point of contact for the emergency services, public utilities, senior management, staff.	All
3.	Issue announcements to staff, clients and the media (see Annex).	PR Department
4.	Undertake a site survey (if relevant) with departmental managers. Main points: - which services can use the site immediately? - which services can use the site after cosmetic attention? - when can they re-occupy the site? - which services cannot be re-housed in the short term? - what amount of office space is required for priority functions? - decide outline strategy for re-occupation of and/or re-deployment to an alternative site.	Director of Economic Development
5.	Organise safety survey and arrangements to make the site secure.	Health and Safety Manager
6.	Consider salvage options.	Risk and Business Continuity Manager
7.	Assess the effect of the incident on critical business functions and start planning the order of their reinstatement in accordance with pre-planned priorities.	Departmental Business Continuity Co-ordinators
8.	Contact IT Operational Support Staff and alert them to the situation developing.	Head of IT
9.	Assess the impact on the telephone network and make contact with appropriate staff and agencies required to reinstate networks.	Principal Administration Officer
10.	Liaise with departmental managers and/or their IT staff to assess the impact on IT hard/software, peripherals and network installations: a decide what is reinstateable using in-house resources; b which equipment will require external services for reinstatement; c plan and implement the initial in-house deployment of supporting staff; d alert staff and suppliers of the increasing demands to be made on them.	Head of IT
11.	Liaise with the departments and make an initial assessment about the replenishment of damaged furniture, fittings, equipment and supplies. Alert staff	Head of Finance

	and suppliers of the likely demands on them.	
12.	The team Leader will chair a second meeting of the recovery team as appropriate with the following objectives: a to receive initial reports; b to agree objectives for the next 24 hours; c to establish staff rotas; d to set up subsequent meetings.	Team Leader

ANNEX A - 2 ACTION TAKEN DURING THE NEXT 24 HOURS

Lead

1.	Continue to maintain log of events and keep staff, clients and Communications/news media regularly updated.	Head of IT
2.	EITHER plan the re-allocation of office space on site in accordance with departmental priorities OR plan to move to an alternative site. Consider the following points: a contact with commercial estate agents to acquire alternative site; b transport arrangements to and from all temporary locations; c the removal of vital documents from the disaster site and subsequent storage; d the removal of re-usable equipment from the disaster site and subsequent storage; e space requirement for critical business functions; f feeding and welfare arrangements.	Director of Economic Development
3.	Agree essential installation schedules with public utilities and other suppliers at either the disaster site or alternative site (electricity, heating, lighting, water, air conditioning, fire detection/alarm systems, access control systems, telephones).	Director of Economic Development
4.	Agree office equipment and supplies delivery schedules with Head of Procurement.	Head of Finance
5.	Check on measures being taken for disaster site safety and security.	Health and Safety Manager
6.	Implement salvage plan and arrange temporary storage as necessary.	Risk and Business Continuity Manager
7.	Reorganise postal arrangements as necessary.	Risk and Business Continuity Manager
8.	Finalise telecommunications services to the required site(s).	Principal Administration Officer
9.	Define the priorities for restoring networks on a gradual basis in order to provide a minimum initial communications requirement for departmental critical functions.	Head of IT
10.	In conjunction with departmental heads prepare to initiate interim back-up procedures for priority systems.	Head of IT/Departments
11.	Finalise requirements for hard/software and peripherals replacements and agree installation schedules.	Head of IT

12.	Start and maintain a record of financial expenditure and collate information as may be required by the Risk and Business Continuity Manager.	All
13.	Consolidate with core team members arrangements for reinstating critical business functions in priority order whether on-site or at alternative premises. Brief staff accordingly.	Departments
14.	In conjunction with the PR Department ensure that clients are re-assured that service delivery will be returned to normality as soon as possible.	As above

88-2009

ANNEX A - 3   ACTION TAKEN DURING THE NEXT MONTH

<u>Lead</u>

1.	Continue internal and external announcements as necessary and the record of events.	PR Department
2.	Continue to keep financial records.	All
3.	Monitor the installation/repair of essential services to the disaster site/alternative site (electricity, heating, lighting, water, air conditioning, fire detection, alarm systems, access, control systems, telephones).	Director of Economic Development
4.	Continue removal and re -deployment of salvaged items from the disaster site.	Risk and Business Continuity Manager
5.	Monitor measures being taken for disaster site safety and security.	Health and Safety Manager
6.	Ensure that the telecommunications network is tested and operates. Continue to provide support/re -configuration to departments when required.	Principal Administration Officer
7.	Monitor the programme for the installation and back-up of IT networks, hard/software and peripherals in the agreed order of priority.	Head of IT
8.	Monitor the programme for the delivery of supplies to the disaster/alternative site.	Head of Finance
9.	Monitor the reinstatement of functions in order of priority and the consequent effects on service delivery.	Dept Heads
10.	Monitor overall progress on a regular basis.	Chief Executive
11.	Co-ordinate interim and/or final report drafting.	Chief Executive

ANNEX A - 3   SAMPLE MESSAGE TO STAFF

1.	This is .... (name) from .... (department).
	There has been an incident at .... and .... (describe what has happened).
2.	The Authority will continue business; the City Council Business Continuity plan is being put into operation.
3.	All jobs should be safe.
4.	Payment of your salary should not be affected.
5.	In the short term, you will be working under .... (team leader), on .... (task), until we get back to normal.
6.	Please wear .... Please bring .... (depending on situation).
7.	Because this is an emergency, will you be prepared to work overtime? ....… (details of shifts over the next week).
8.	Will anything prevent you from working these hours, and if so, is there anything we could do to help?
9.	Payment for overtime will be confirmed at a later date.
10.	If you have any further queries, the number to telephone is ....

ANNEX B

DISASTER RECOVERY FINANCIAL RECORD

<u>**PURCHASES**</u>

DATE	TIME	LOCATION	DESCRIPTION OF ITEM	REASON FOR PURCHASE	SUPPLIER/ PURCHASER	£

ANNEX C

SALVAGE - MAIN PROBLEMS/SAFETY

1. General: Apart from the obvious and visible damage, those involved in the salvage process need to be aware of:

    a. Health and safety problems such as chemical contamination, asbestos and live electrical supplies.

    b. Deterioration of materials through high humidity or chemical attack:
        (1) Hydrochloric acid arising from the combustion of PVC can penetrate concrete in wet conditions and cause corrosion of the reinforcing steel.
        (2) Hydrochloric acid will also quickly corrode any exposed metal surface, such as steel pipes, tubes galvanised conduits, cable trays, trunking, aluminium partitions and window frames. Removal of the corrosion product and the chloride contamination is all that is required to restore the item to full function and to ensure that no further deterioration will occur.
        (3) After a fire, clean-up materials used in fighting the fire (water, halon, foam, dry powder).

    c. Dirt and contamination can be spread from damaged parts of a building to clean parts,

    d. Theft from the damaged building.

    e. On-going damage from the weather.

    f. A repeat attack if damage was caused deliberately.

2. **Entry to Buildings/Rooms:**

    a. Do not enter any damaged building until it has been declared safe by both the Fire Services and the City Engineer's.

    b. Allow only authorised personnel wearing appropriate protective clothing to enter.

    c. Cut off all power supplies to the damaged area.

    d. Check for hazards.

    e. Identify and protect any evidence of deliberate damage.

    f. Cut off the water supply to leaking pipes.

    g. Make safe, damaged structures: erect safety barriers, hazard signs and identify walk routes.

    h. Protect undamaged equipment.

3. <u>**Rooms containing Computer Equipment:**</u>

    a. Ensure that all power is turned off.

    b. Protect undamaged equipment.

    c. Remove surface dust debris soot with brush or vacuum cleaner.

    d. Remove water and start drying process.

    e. Consult Salvage Engineer on the next step.

4. Resumption of Operations:

    a.   Ensure safe, controlled access.

    b.   Protect from weather.

    c.   Recover materials and dispose of waste.

    d.   Nominate temporary accommodation for storage of undamaged/damaged equipment and records.

    e.   Arrange for safe temporary power supplies.

    f.   If air-conditioning or heating is available, raise the temperature.

    g.   Provide ventilation to aid drying.

    h.   Maintain an inventory of equipment damaged/lost and replaced/repaired.

ANNEX C-1   DAMAGED DOCUMENTS

1.   General: Documents are easily damaged by fire and water, but recovery of the information is often possible and sometimes recovery of the documents themselves. The Council would also utilise Harwell Drying Restoration Services. The service provided includes:-

- a 24 hour emergency hotline;
- transport of wet documents to cold store;
- free use of Harwell's purpose designed refrigerated storage facilities;
- freeze/vacuum

1.1   <u>Types of Documents:</u> Documents can be broken down into four categories:

     a.   <u>**Record or information retrieval ('loose' documents):**</u> Record retrieval can be summarised as the relatively simple act of recovering the information which is recorded, without need of the original document. In this instance a photocopy or and electronic record will suffice.

     b.   <u>**Original document retrieval ('loose' documents):**</u> Original document retrieval involves retention of the original document as the valid record. This may be because of a legal or similar statutory requirement.

     c.   <u>**Book retrieval ('tight' documents):**</u> Book retrieval is where the 'victims' are bound volumes which are unlikely to have been deeply penetrated by the smoke fumes and/or water.

     d.   **Art paper retrieval ('tight' documents):** Art paper or coated paper which has been finished to a high gloss or treated in some other special manner presents a particular problem. Once this type of paper gets damp and begins to dry the leaves fuse together and become permanently bonded.

       Whatever the category, the aim behind all document recovery is to reinstate documents that can be read, handled and stored.

3.   <u>**Main Problems**</u>

     a.   Mould will begin to appear within 48 hours in moist conditions, if the temperature is above 60c, and removal of the marks left by mould is almost impossible.

     b.   Wet paper is very heavy and is very easily damaged by handling.

     c.   It is an unpleasant job, as documents to be recovered are dirty, wet and smell.

     d.   Possible health problems for people doing the job, from polluted water and from dangerous dust.

     e.   Logistic problems of separating each page to dry, then re-assembling the documents correctly.

4.   <u>**Remedial Action:**</u> Successful recovery of documents is dependent upon prompt initial actions:

     a.   Prevent uncontrolled drying or crumbling, by keeping documents closed and gently wrapping them in cling film. Store the sealed documents temporarily in archival sized boxes to aid handling and identification.

     b.   Freeze the documents. This both prevents mould growth and protects against damage while handling. A commercial frozen food trailer provides a useful first-aid cool chamber, and can be obtained via the Emergency Planning Officer.

     c.   Get professional advice and help as soon as practicable.

ANNEX C-2   DAMAGED COMPUTER AND COMMUNICATIONS EQUIPMENT

1.   **General Rules:**

    a.   It is vital that in the event of damage to computer and communications systems, caused by fire, smoke, water, chemicals etc, qualified engineers take remedial action as soon as possible.

        The speed with which corrosion damage occurs will depend on the conditions. In extreme conditions of heavy contamination in a hot, moist environment, it is vital that salvage begins no later than 24 hours after the incident has occurred. In warm, dry conditions, unpowered equipment will resist corrosion for a long time.

        In either case it should not be assumed that equipment is a total loss just because there has been a delay.

    b.   The following general rules will help to minimise the damage caused:
       (1)   **Do not switch on equipment** which may be damaged, wet or contaminated (even for a few seconds to see whether it works) as this will cause power supply problems such as to on-board batteries.
       (2)   **Do not move damaged or contaminated equipment** unless absolutely necessary. **If** you do move it, handle it as carefully as possible.

2.   After Fire: Even a relatively small **fire** can cause serious contamination problems.

    a.   **Main Problems:**

       (1)   Heat from fire will cause direct damage, but electronic equipment will stand temperatures up to 700c if switched off. If there is still paint on metal parts and plastic parts have not melted, the equipment may still be recoverable. Any water used for fire fighting on upper floors will lead to dirt and acid contamination on lower floors.
       (2)   Soot (carbon particles) will absorb water, creating a moist environment which helps corrosion. It will settle on circuits and components inside equipment and cause short-circuits if electronic power is applied.
       (3)   PVC is a plastic which is used extensively in modern buildings, in cable insulation, furniture, document binders etc. When PVC is burned it produces a large volume of hydrogen chloride gas which combine with airborne water vapour to form hydrochloric acid (a kilogram of PVC will produce 1.4 litres of concentrated acid). The acid condenses on cool surfaces throughout the building which contains the fire, including circuit boards inside equipment in areas which seem to be little affected by smoke.
       (4)   Unpowered circuits are reasonably resistant to attack but any electrical activity will cause shorting and electroplating. Exposed metal surfaces (steel, stainless steel, galvanised steel, aluminium, brass, copper) will corrode rapidly. Water and humid air greatly increase the rate of corrosion.

    b.   **Remedial Action:**

       (1)   Ventilate the whole building as soon as possible in order to disperse smoke and other contaminants.
       (2)   Remove or isolate the power including battery back-up supplies.
       (3)   Lower relative humidity to minimise corrosion. Fan heaters with dehumidifiers are a good combination, but be careful not to make equipment too hot. Do not use oil stores or propane gas heaters, as these generate water vapour.
       (4)   Cover items that cannot be removed with plastic sheeting, and place dehumidifiers under the sheeting.

After Water Damage:

a. <u>**Main Problems:**</u>

    (1)   Dirty water, sludge and possibly chemical contaminants will have breached the casings of computers and communication equipment. This will cause damaging short circuits if the equipment is powered up, and the dampness will speed up corrosion.

    (2)   Water may have soaked into the fabric of the building, maintaining a high level of humidity long after the water has been removed.

b. **Remedial Action:**

The main requirement is to minimise corrosion until equipment can be washed, by removing water and then lowering the relative humidity of air below 450. The following points should be followed:

    (1)   Remove or isolate all power, including battery back-up supplies, to prevent shorting.

    (2)   Tilt equipment so that water runs off the circuit boards and out of the equipment.

    (3)   Carefully remove portable equipment to a clean dry area.

    (4)   Cover any items that cannot be moved with plastic sheeting to protect from falling water.

    (5)   Ventilate the affected area.

    (6)   Remove wet objects that will retain water, such as carpets, curtains and paper.

    (7)   Use dehumidifiers to remove moisture from affected areas.