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Disaster Recovery for Archives, Libraries and Records Management Systems in Australia and New Zealand

Judith Doig

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Preface

This is a book about disaster recovery for archivists, librarians and records managers. It discusses the history of disaster recovery and attempts to identify disasters which have occurred in Australia and New Zealand. Despite the lack of publicity which attends most disaster affecting libraries and archives, more than sixty such disasters have been identified, and it is accepted that there are many more which have not been reported. The book aims to persuade the reader that disasters may happen in even the best run institution, to alert the reader to what is involved in developing a disaster recovery plan, to guide the reader in the development of such a plan, and, finally, to discuss ways in which staff may be trained in the procedures and skills involved. The book covers, primarily, paper-based files, books and records, but, as much modern communication is through various forms of multimedia, these are also included. The book does not seek to deal with textiles, paintings or artefacts.

There are many management issues which must be considered before a plan is developed. The environment in which the institution is located will affect the likelihood of disaster. There may be nearby rivers which may flood after heavy rain, cyclones or earthquakes may be common, or there may be danger of deliberate damage from disaffected people. The institution must decide what its priorities will be if disaster strikes. Are there specific items which must be retrieved because their existence is vital to the institution or to the national heritage? Is the restoration of service the main priority? Decisions must be made and must be accepted by staff. The costs of recovery must be considered as must the extent and nature of insurance. The choice of a disaster controller needs careful thought. The Disaster Controller must be capable of organising and directing the recovery and must be able to consult with members of any wider institution and with the emergency services. Staff must be involved in the development of the plan so that they know of its existence and accept the decisions which it makes. Once the plan is written, the staff who will act as team leaders must be trained so that they will be able to act effectively if disaster does strike. Once written, the plan must be regularly reviewed as changes to procedures or organisation may render it ineffective.

Training must be run on at least an annual basis. Even if there is not staff turnover with new members to be trained, the existing team members may find that their knowledge of the plan becomes vague as other activities take precedence. Training may be run internally by the Disaster Controller, or a decision may be made to send selected members to some of the external workshops which are available.

The author should register a source of bias. She has been a member of the CAVAL (Cooperative Action by Victorian Academic Libraries) Disaster Management Group since its inception and has been a co-author of publications produced by that group. This has, inevitably, influenced the content of this handbook. This should not be seen as a claim for the superiority of CAVAL methods to those used by others; it is just that these are the methods with which the author is most familiar. The important roles played by other individuals and organisations are acknowledged and are discussed in this book.

A note: the Disaster Controller has been spoken of throughout this work as 'he'. This is not to suggest that many women do not serve as Disaster Controllers (the author did, for one), but the practice is followed because an attempt to be gender neutral proved so clumsy that the effort was abandoned.

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Ever since man first scratched on the walls of his cave he has sought to create a record of his world and of his part in it. While a record may outlast its creator, that record has always been vulnerable. Clay tablets will break, papyrus and paper will burn or will be affected by water. Climate and pollution will hasten decay. Film will burn, and electronic records may be corrupted by magnetic forces. In addition to the threat imposed by nature, man himself may cause destruction. Records may fall victim to carelessness, or to deliberate or random destruction in war. They may be destroyed by those who feel threatened by the content, or they may be lost to mindless vandalism.

In *Protecting the Library and Its Resources* there is a chronology of library fires.[1] The earliest listed occurred in 612 BC when, it is indicated, the library at Assurbanipal was laid waste by the Medes, while the latest cited occurred in 1962. Two hundred and fifty occurrences are given, including the most famous of early library disasters, the destruction of the library at Alexandria in the third century AD. Other noteworthy losses include those libraries burnt in the Great Fire of London, the Library of Congress, burned by the British in 1812, libraries in the great Chicago fire and those lost in the fire following the San Francisco earthquake of 1906. Millions of volumes were lost during the Second World War. This list was, however, published in 1963 and thus pre-dates the most significant library disaster of recent times, that caused by the Florence flood in 1966. It was the almost unbelievable extent and severity of this disaster that provided the impetus for what is currently described as 'disaster recovery'.

The Florence Flood

Florence's ordeal began on 4 November 1966 when, following nineteen inches of rain in forty-eight hours, a 'wall of water' descended on the city



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of Florence as the Arno River broke its banks.[2] The narrow streets of Florence exacerbated the speed of the flood waters. Carolyn Horton said:

The great force of the floodwater also compressed air in some basements so powerfully that the ceilings were burst open, causing the floor above to collapse into the room below. In addition to its inherent destructiveness the flood water was laden with fine mud which seeped into and was precipitated on books and other objects....[3]

Horton also notes that much material remained stored in basement areas where it had been placed as a safety measure during the Second World War when German artillery bombarded the city. In the Biblioteca Nazionale Centrale nearly 1.2 million volumes and pamphlets were flooded and a great part buried in mud. Much newspaper material, most of it unique, was affected as was the computer used for publication of the national bibliography as well as the catalogue of 8 million cards. Other libraries suffered similarly. It was estimated that, throughout the city, 2 million volumes were under water.[4] The Biblioteca Nazionale Centrale was fortunate in the leadership provided by its director, Emanuele Casamassima, and he impressed all those who worked on the disaster recovery. Arthur Hamlin says:

Until at least the last days of November, he had not once gone home. Dressed in a coverall like Churchill, wearing the rubber boots of every Florentine, he was always there, directing the salvage operation, preparing the reports, marshalling the equipment, and perfecting the plan for the future.[5]

While those in Florence battled to recover from the floods, help came pouring in. The disaster was reported worldwide and, in addition to humanitarian relief supplies, conservators, bookbinders and other experts came from Italy, from Europe and the United States, and were joined by thousands of students and other volunteers. As Horton says: 'Because the problem that Florence faces in saving almost two million wet books is unprecedented, it has commanded the attention of many of the conservators of the world.'[6]

It has been suggested, indeed, that conservation can be seen in terms of 'before the flood' and 'after the flood'. Sherelyn Ogden has said:

The emphasis of conservation work in Florence was physical treatment. Conservators from many countries met in Florence to

develop ways to salvage the masses of flood damaged materials. They compared known methods, decided which were best, and either used or adapted the methods for applications to the problems in hand.[7]

These conservators then returned to their own countries and implemented the knowledge that they had gained. Ogden notes that the term 'Anglo-Florentines' was sometimes used to refer to the British conservators who went to Florence. One of these, Peter Waters, later went to the Library of Congress where, in 1979, he wrote the classic work on disaster recovery: *Procedures for Salvage of Water-Damaged Library Materials.*[8] The restoration of the books of Florence is still in progress, thirty years later.

Other Disasters

Disasters continued; floods ensued from natural causes and from equipment failure; fires were started by arsonists, by lightning or by faulty wiring; earthquakes and hurricanes struck, and vandals and rioters created wilful damage. The Jewish Theological Seminary, New York suffered a major fire five months before the floods in Florence. Seventy thousand volumes were burnt and a further 150,000 damaged by water. Menahem Schmelzer says: 'Thousands of books which escaped the barbaric destruction in Europe in the 1930's and 1940's which had found a haven in the Seminary Library in this free country were now being destroyed by nature.'[9] Schmelzer notes that the books destroyed by fire were later buried in accordance with Jewish custom which 'prefers this kind of respectful disposal of unusable Hebrew texts of religious character.' [10]

Hurricanes have caused many library disasters. Hurricane Agnes ravaged the eastern coast of the United States in 1972. It turned inland and stalled for three days of continuous rain along the New York/Pennsylvania line. The city of Corning is located near the point where three rivers merge. Usually the river is around two feet deep, but at the height of the flood the river crested at 27 to 28 feet and swept through the town. The next morning the water had gone, but in the meantime it had surged through the Corning Glass Museum to a height, on the main floor, of fifteen feet. As part of the ill luck which so often attends such disasters, the entire full-time professional staff were attending a conference in Mexico. The staff remaining, aided by volunteers, commenced recovery. Books had so expanded that crowbars were necessary to dislodge them from the stacks. Incunabula and rare books

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were buried in slime. Because of the damage to the area there was no electricity, no running water and no supplies. It was still raining. Staff were able to locate radio transmitters and seek help from outside the area. Material was trucked to freezers 20 to 25 miles away. When the time came for the frozen items to be restored, the most valuable books were sent to Carolyn Horton for her professional care while staff thawed and air-dried the rest.

An important disaster recovery was mounted in 1978 after the Meyer Library at Stanford University was flooded. An eight-inch sprinkler main burst at 2.51 in the morning. Although the rupture happened some twenty feet outside the Meyer building, the water flooded into an area which had been excavated for a new construction and found its way through a number of gaps which had been drilled in the wall. Water entered an upper floor in a tiered stack, spread over an area of 5000 square feet and dripped through to lower levels. Although an alarm was triggered and the water turned off twenty minutes after the rupture occurred, around 50,000 volumes were affected. The damage was aggravated by the amount of silt which coated the books (and clogged the pumps). It was agreed to freeze-dry the damaged material and, after investigation, an agreement was reached with the Lockheed Company for a vacuum chamber in their facility to be utilised. Lockheed decided later to contribute the cost of this operation as a gift to Stanford. Sally Buchanan (later to play a role in Australia's disaster recovery planning) was engaged to manage the recovery, and advice was sought from Peter Waters. Although freeze-drying as a technique had been known since 1971, this was its first major use, and the detailed reports which were written by Sally Buchanan and Philip Leighton provided valuable information for others facing similar problems.[11]

The best known disaster of recent years was that suffered by the Library of the Leningrad Academy of Sciences which was severely damaged by fire in 1988. *The New York Times* reported that: '400,000 books were destroyed, 3.6 million were damaged by water, 10,000 became infected with mold, and 7.5 million are in need of preventive care to block the spread of fungus.'[12] Peter Waters and Sally Buchanan were among the conservators called in to assist with the recovery. Peter Waters has discussed his experiences in a paper presented to a conference held in Sydney in 1995.[13] The fire occurred spontaneously in two separate locations, leading to a suspicion that arson was the cause. There were neither smoke detection nor fire suppression systems. To exacerbate the situation, the director had a heart attack three days after the fire and was replaced by his deputy. Peter Waters has expressed doubt about the loss figures reported by the media, but the amount was still massive. As in the

case of the Florence floods, restoration of the damaged materials continues to this day.

A disaster to which reference will be made later occurred at Uppark, a National Trust house in England, in 1990. Following a major fire, Maureen Lovering, an architectural conservator, used archeological recording techniques to identify items found upon the floor after the fire.

Civil war destroyed the Central Library of the University of Bucharest and other libraries in Rumania. More recently libraries in Sarajevo and elsewhere in Bosnia and in Serbia have been destroyed.

Disasters in Australia and New Zealand

While fire and flood have been common in Australia and New Zealand (and New Zealand has had the added threat of frequent earthquakes), libraries and archives have been relatively fortunate. Most recorded disasters have occurred since the Second World War. Since 1945 libraries have grown in size, type and number. The old Mechanics Institute libraries have been replaced by municipal libraries, while the number of Australian universities increased from six to thirty-eight. Special libraries have been established, and archival repositories have grown in size, organisation and sophistication. There has, therefore, been far greater scope for disaster. Similarly, since the Second World War, disasters are more likely to be reported. This is not only because of the greater number of professional publications reporting on library and archival matters but also because of the greater perceived importance of such institutions to the public. Before the Second World War reports of library fires or the effect of a flood on the local Mechanics Institute are likely to have been reported only as brief news items in the local press – unless something unusual about the disaster caused it to be covered in the few early library publications. For instance, the Kensington and Norwood Mechanics Institute was reported (in *Library Record of Australia*) when there was a fire there.[14] Then, in the next issue of the *Library Record of Australia*, it was reported

...a sensational story of robbery with violence, told by the late librarian, who said he had been attacked in his quarters, bound, and tortured with a red-hot key until he revealed the whereabouts of £100, which he had only that day withdrawn from the bank. After further developments, and careful enquiry, the committee resolved to dismiss the gentleman who posed as the victim of this attack.[15]

Frustratingly, there is no further reference to this.

The earliest disaster that we have been able to identify occurred in South Australia in 1836 when a trunkload of books being shipped to Adelaide to set up a circulating library was dropped in the Port River. Some of these volumes are still held by the State Library of South Australia, so this was also the first example of disaster recovery in Australia. A similar disaster was the first recorded in New Zealand when the ship *White Swan* was wrecked in 1862 while transferring government records from Auckland to Wellington. The loss, it is recorded, was 'small'. The building housing the Palmerston North Public Library was destroyed by fire in 1882; in addition to the library collection, vital town records were lost as the librarian was also the Registrar of Births, Deaths and Marriages. Records were lost in a Post Office fire in 1887 and in a 1907 fire in Parliament House. It is interesting to note that a 1902 report on preserving national records recommended:

It would be necessary to have these documents kept in a fire-proof place; it might even be advisable to make records of the more important facts on some imperishable substance. Papers, even in a safe, are apt to be illegible if subjected to severe heat.[16]

This is advice that was ahead of its time; ninety years later it would still be pertinent.

The Greymouth Municipal Library, on the west coast of the South Island of New Zealand, was destroyed by fire in 1947, and in 1952 the Hope Gibbons building in Wellington, which stored important non-current records from many government departments, suffered a major fire and a large number of irreplaceable records was lost.

The State Library of New South Wales suffered disasters in early years; in 1914 heavy rain caused several feet of flooding and the Mitchell Library was only saved from disaster by a sandbagged embankment; around the same time overtaxed floor loadings caused part of the ceiling of the librarian's office to fall in. In 1950 there was a fire in a store room on the roof of the Mitchell Library and slight water damage resulted; an added concern was that the automatic fire alarm did not work.

In 1952 the shire of Rutherglen experienced a disaster when its '...recently opened library was burned down last month. Fortunately, this regrettable setback to library development in the Upper Murray area will be alleviated by a special grant of £2,500 from the Free Library Service Board to the Upper Murray Regional Library Service.' [17] The Maitland floods of 1955 also destroyed library stocks: '...the severe damage suffered by the Maitland Public Library during the recent devastating

floods. The whole book stock, together with its catalogue, seems likely to be written off as a complete loss.'[18] There followed an appeal for duplicates to help re-stock the library. At this stage the reaction to disaster appears to be to replace; there is no discussion of recovery or of restoration.

In the mid-1960s word of the recovery mounted after the Florence floods had been received in Australia. The Australian government contributed \$30,000 which, together with \$100,000 donated by the Australian community, went towards:

...the establishment of a print restoration laboratory in the Central National Library in Florence. The laboratory is a self-contained unit, well equipped and equal to the best of its type in the world, and dovetails smoothly into the rest of the work being carried out by the National Library. It deals not only with prints and maps but with certain special problems of books. The work was undertaken and supervised by Mr W.M. Boustead, Conservator of the Art Gallery of New South Wales, who left Florence in November 1967 on completing his work. This permanent laboratory will be a lasting link between Australia and Italy.[19]

The *Australian Library Journal* records the gift of money from the Library Association of Australia to Florence to assist with the recovery, but there is no reporting of the disaster effort. In November 1970 a fire in the roof of the Mitchell Library followed a welding accident. By now, however, information about disaster recovery was percolating through the library community and when two major disasters occurred in the 1970s – the Brisbane floods and Cyclone Tracy – there was not only disaster recovery but the recovery was documented and accounts published.

Floods in Brisbane

Brisbane suffered severe flooding on the Australia Day weekend, January 1972. Lee McGregor and Jim Bruce have described the recovery of the Queensland State Archives.[20] They report that, while the State Archives themselves were undamaged, many government departments were not so lucky. Jim Bruce had recently returned from a study tour during which he investigated document restoration (although he notes that he had been unable to visit Florence) and it was his knowledge that guided the recovery exercise. The floods occurred over the period 25-31 January, and assistance was requested on 30 January by the Children's Services

Department. McGregor notes that the water had reached a level of two metres, and the files had been submerged for three days. The material consisted of vital and unduplicated files relating to adoptions. Files were removed and shipped for restoration at the rate of two truckloads per day. The files were left in the sun for a few hours until they were no longer dripping. They were then moved into an air-conditioned area where the controlled humidity slowed down the growth of mould but did not prevent it. They attempted vacuum drying, using their vacuum-type fumigator, but found that this had little effect and the idea was abandoned. After a fortnight mould became apparent and it was decided to freeze the remaining material (5.48 linear metres of files). It was recognised that the life expectancy of the paper would be greatly reduced by now and that it would be necessary to microfilm much of this material. Later material was received from the Mines Department; this was in very bad condition with a 'wide variety of moulds', rusted paper clips, photographs stuck together and identifying marking (which had been done in water-soluble ink) lost.

McGregor and Bruce urge that freezing be done in similar circumstances and note, with approval, another collection that had been frozen immediately after the flood and which, when thawed, showed no signs of mould or bacteria growth. They note, also, the need for improvisation and adaptability to deal with the lack of funds, equipment and special expertise. It was a notable exercise in intelligent and effective disaster recovery carried out with none of the resources now available.

Cyclone Tracy and Darwin

On Christmas morning 1974 Cyclone Tracy struck Darwin. For over four hours the city experienced winds of 225 km per hour together with torrential rain. Forty people died and destruction was universal. Loos and Braithwaite note:

The old library building (the Darwin Public Library) was not totally demolished, but exterior walls collapsed and parts of the roof were blown off. Approximately 60% of stock was lost – water damaged either in the library or while on loan (the normal two books per borrower had been increased to four to tide people over the Christmas-New Year holidays). Of course, very few books on loan ever came back, although the staff were surprised by the number of apologetic messages received about lost books.[21]

Faced with total destruction – ‘almost every structure in the city of 40,000 people was damaged’ – a massive evacuation was undertaken and 30,000 people left the city. The NTLS (Northern Territory Library Service) administration unit was relocated to Canberra and remained there for two years after the cyclone. ‘This was in accordance with government policy that only essential personnel be retained in Darwin so as not to prove a strain on the town’s limited accommodation and services during the rebuilding period.’[22] Carol Mills writes:

Some staff never came back. Some who had been there were evacuated never to return. Others had important private problems to resolve. Libraries were neglected by relief workers if it was not believed that someone lay under the wreckage or unless representing a hazard in some way.[23]

A small number of local library staff remained and battled to save stock and restore some service. Mills says that one of their aims was to try to get a service operative for those recovery workers in Darwin who desperately needed recreation to counterbalance their grim task.

Some departmental libraries were moved to other premises, and the Darwin Community College Library was crowded into less than half its former accommodation because of space needed by the rest of the college. Some Darwin Community College Library material was shipped to Alice Springs. The Northern Territory collection of the Darwin Public Library was sent to Canberra where it was freeze-dried. Government records were a particular concern. N.J. Corbett, an archival conservator, notes that many government departments functioned semi-autonomously, each with its own registry and with archival material of all types. Much of the material was unique and vital for government and much was not duplicated.

On 4 January the Director of the Australian Archives and the Chief Archivist visited Darwin and decided to set up a reclamation centre in Brisbane and to remove the endangered files and registers by air as soon as possible. Corbett reports that boxed files and files in cabinets fared well, while exposed files and books were in deplorable condition. There was much mould on these. Material was dried and fumigated. Corbett notes (and this will be picked up later):

Clearly, staff, having survived the holocaust, can be expected to react afterwards with various psychological responses upon which I am not qualified to comment. However, there was ample

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evidence of apathy resulting in further damage by rain in weeks following the cyclone....[24]

A year later Dr Thea Schmitz of the Northern Territory Library Service referred, in the *Australian Library Journal*, to the donated material received from libraries around Australia. She added:

It is already well known that the Darwin Public Library building was damaged beyond repair. The Nightcliff branch library was also severely damaged but has since been repaired. Service to the public at the Darwin library recommenced on 6 January from a small annexe at the rear of the main building, and this still serves as both public and work areas. The Darwin staff has done, and still continues to do devoted work under extremely cramped and trying conditions.[25]

All staff did not return to Darwin from Canberra until 1977 and then existed in temporary premises for some years.

On Ash Wednesday in 1983 extensive bushfires affected Victoria and South Australia and resulted in the destruction of the Theological Library at St Michael's House, Crafers, South Australia; the entire collection of 40,000 volumes was lost. Much of this material was unique and irreplaceable. The following year there was flood damage at the records repository of Lindeman (Holdings) Ltd in Sydney. Following violent storms a nearby creek overflowed and flooded the records repository to a level of sixty centimetres. Seventy shelf metres of paper records were completely submerged, while a further forty shelf metres were soaked. Temporary staff were hired from an employment agency. As material was removed from the flooded site it was listed with a record of the damage suffered and replacement cost. This last was required by the insurance company. So that all effort might be directed to salvaging the most valuable records, permission was gained to destroy less vital items. An air-drying process was set up for the material to be salvaged. Whenever weather permitted, those records which did not contain sensitive information were taken outside and dried in the fresh air. The recovery process took two months. Warwick Hirst makes an important point:

All salvage and drying operations need to be performed with speed balanced with care. To this end the cost of hiring additional labour is likely to be considerably less than the cost of later restoration work made necessary by delays in implementing initial drying procedures.[26]

In the same year the Latham Primary School Library experienced flooding and used a microwave oven to dry books. Lynn Fletcher and Lynne Anderson report that about 200 items were affected, and they decided, initially, to freeze all items at a retail butcher shop.[27] The books were then stood upright with fanned pages in a microwave oven at the setting for 'Beef medium' with times appropriate to the weight of the item. They report that time taken varied from three to fifteen minutes and that most books were successfully dried. They report that glues and bindings were unaffected. Although an interesting (and successful) experiment, conservators do not recommend this procedure as it is difficult to fine tune the drying process.

In January 1985 the Victoria University Library in Wellington suffered severe water damage following a thunderstorm. About 1500 volumes were affected, together with microfilm, slides and videotapes, while the Cataloguing Department had to vacate its workroom. The library had a disaster plan, and staff had been trained. As lectures were not due to commence until March, staff were able to use the reading room as air-drying space. Kathleen Coleridge speaks from experience:

Wet books may look an overwhelming disaster, but their treatment is much less urgent than photographic materials: a number of slides were lost because damage from the first minor leaks was overlooked.... Lists of suppliers or information are essential, but not all equipment will be available immediately it is wanted. Nearly three days of telephone negotiation were necessary before the Wellington firms offering fans for hire could supply three: we could have used seven.[28]

This last point is one which many disaster plans have not recognised, and her reminder is salutary. She adds:

One thing we would do differently, should we have a repeat experience, is to spell out to *all* affected staff how long the clearing-up process was likely to take. Not all staff grasped how long the disruption would continue and their anxieties were apparent as the third, and then the fourth, week passed.[29]

This is also a valuable point, it is not just the books, records and journals which must be monitored in a disaster recovery. The staff are also vital to the operation of the library or archive, and their morale must be addressed as well.

Fire in the National Library of Australia

In 1985 the pivotal event in Australian disaster recovery occurred. A fire broke out in the National Library of Australia. A major project to remove asbestos insulation was in progress at the time of the fire. The fire began around 7 pm on Friday 9 March and apparently started beneath the roof. It was thought that the fire might have been fuelled by the large amount of plastic sheeting being used by the contractor. Spot fires occurred elsewhere in the building, and it was suspected that this might have been caused by burning material finding its way through the building via electric service ducts. Thick smoke filled the building. Firemen were unable to contain the blaze within the building and were forced to remove part of the roof and direct hoses though the roof space. The Director General reported:

Water seeped extensively through the concrete floors and particularly through the expansion points in the building. The fire brigade made valiant efforts to divert the main volume of the water down one stairwell, so that it could be pumped out at basement level. At each landing, however, water poured back under the fire proof doors into the main part of the building.[30]

Soot was also a problem. Once the fire was extinguished a group of senior staff entered the building and attempted to minimise water damage. They tried to dam water flow beneath doors, directing water flows into containers and to shift material from the areas most affected. This work continued until about 3.00 am. The following day, staff, directed by Ian Cook, Director, Preservation Services, set about surveying the extent of the damage and began removing items to the foyer area for treatment. Library staff had some experience with water damage previously so were not unfamiliar with the problem faced. Staff began to mop up water. Books (ca. 1000) were moved to the front foyer, placed on newsprint and blotting paper and spread out for air-drying. Windows were opened. Dehumidifiers and fans were borrowed. The library's computer was affected and had to be removed for overhaul. This last, affecting as it did, service to distant customers through Medline and ABN (the Australian Bibliographic Network), brought home some of the implications of disaster to the Australian library world at large. A replacement computer was established off site.

The Director General, Harrison Bryan, was available to speak with the media and did so on a number of occasions in the following days. The

media were allowed controlled access to view and film the worst affected areas of the collection.

By the evening of 9 March a temporary covering of tarpaulin had been spread over the hole in the roof. It was decided that staff would return to work on the Monday but that the library would not be open to the public until a later date.

The Director-General undertook that staff would be withdrawn from any area, and indeed from the Library as a whole, if conditions became intolerable but, in fact, the staff have cooperated extremely well.[31]

They were not able to use a freezer facility but were able to borrow a small freezer. Soot was very heavy, and two types were identified. One was easily removed by use of a blower and vacuum removal; the other was greasy and difficult to remove. After the initial period the effect of the disaster upon working conditions caused some morale problems.

Why was the National Library fire pivotal in the development of disaster recovery in Australia? There had been more damage in both Darwin and Brisbane, but awareness of the damage suffered by libraries and archives in those cities had been lost amid the greater public and personal loss suffered by those communities. The National Library fire was front page news, albeit not the lead story, in Australia's press. Certainly the National Library was the flagship of Australian libraries; certainly the Director General's availability and willingness to speak to the media and to invite them to view the damage played a part; but probably what caused the greatest awareness across the library community of Australia was that the National Library computer went down. Medline could not be accessed, nor was the Australian Bibliographic Network available. Libraries which had relied on these services were immediately aware that they were not there. The service was not restored until 3 April. The attention of the Australian library community was focused upon the National Library and on what had happened there.

This awareness was accentuated by the visit of Sally Buchanan in July that year. Ms Buchanan had extensive experience in disaster recovery, having been involved in the Stanford Meyer library flood recovery. She has written extensively on the topic and later was one of the disaster recovery experts invited to Leningrad to assist with the aftermath of the fire at the Leningrad Academy of Sciences.

Denis Richardson, University Librarian, University of Melbourne and Warren Horton, State Librarian, State Library of Victoria had invited

Sally Buchanan to Melbourne to run a seminar on the treatment of brittle books. When it was realised that her expertise in disaster recovery would be very valuable, she was also asked, together with Dr Jan Lyall of the National Library, to speak about disaster recovery. Sally Buchanan discussed disaster recovery in general, drawing her examples from the Stanford Meyer flood, while Jan Lyall discussed, very fully and very frankly, what had happened at the National Library. They then gave a similar presentation in Sydney. These visits led to the development of disaster recovery programs in both cities.

Since 1985 there have been many disasters reported in Australia and New Zealand. They have been grouped here according to their cause (rather than in chronological order) as such a grouping will emphasise the sort of threats which institutions may face. The next chapter discusses the way in which an institution may identify the specific disasters to which it may be vulnerable.

Water Damage from Heavy Rain

On New Years Eve 1987 (conforming to the axiom that disasters occur at the worst times possible) a deluge penetrated the roof flashings at the Williamstown Municipal Library, Victoria with damage to stock and fittings.

A major recovery project was required in 1989 when heavy rain in St Kilda Road, Melbourne caused a flash flood. Flood water drained into a disused swimming pool in the basement area of an engineering firm. The firm's archives had been stored, temporarily, in this pool while building renovations were carried out. The rain storm occurred on a Sunday, and the disaster was discovered the following morning when fifteen pallet loads of plans and documents were found floating in the pool, amid dirt and debris. The material was immediately bagged and frozen. Eric Archer, a consulting conservator, was called in to advise and undertook a long-term freeze-drying project using the freeze-drier at the National Library in Canberra (acquired following the fire in 1985). This was the first major use of this technique in Australia.

The aim of the project was to restore the frozen material into readable and usable documents. It was expected that much would then be photocopied. The chamber of the vacuum freeze-drier was two metres deep with a diameter of one metre. It was estimated that a minimum of ten and a maximum of twelve drier loads would be required to handle the material. As this was the first major use of the freeze-drier, teething problems were experienced and it was out of action for a total of nineteen

days during the project. As the storm waters had carried dirt and debris into the swimming pool, it was necessary to clean dirt and debris from the documents after they came from the freeze-drier. It was difficult to separate some pages, and paper used in wet photocopying processes did not survive. In these cases it was necessary to sandwich such paper between Mylar sheets and photocopy the image. Photographs also suffered damage. It took just over twelve months for the project to be completed. A second stage of the project had been proposed in which the documents would be photocopied and the originals destroyed, but the firm decided not to proceed beyond the first stage.

On 21 January 1991 staff of the Ku-ring-gai Municipal Library had just completed a move to a new building when the area was struck by a violent storm. Gutters were clogged by hail stones, and water poured into the library. Staff worked mopping up water, and advice was sought from the State Library of New South Wales. Because the storm damage affected the entire area, the municipality's resources were stretched to the limit. Many staff had to contend with storm damage to their own homes as well as the damage to the library. Over 7000 books in the library were affected. They were set up to dry with the use of dehumidifiers and industrial fans, but mould continued to be a problem. Around 2000 books had to be discarded and an additional number of books on loan were also destroyed. Jennifer Borrell notes that '...the insurance adjuster was so impressed with our book drying efforts (that) our claim should go through unchallenged.'[32]

On 3 January 1993 a roof leak occurred at the library of the CSIRO Black Mountain Library in Canberra. The damage was discovered when staff arrived for work on the following morning at which stage half of one floor of the library had been affected. Staff had experienced previous leaks and so knew what to do. They began by removing books from the damaged area. Shelving then had to be dismantled so that the carpet, which had suffered the major damage, could be dried. Periodical issues were air-dried, although some needed to be replaced. Library staff later installed disaster bins and began work on a disaster plan.

In July 1994 the Information Resource Centre of the CSIRO Department of Building, Construction and Engineering in Melbourne suffered water damage following a roof leak. The damage occurred over a weekend and was discovered when staff arrived on the Monday morning. The Department called in contractors (Munters Ltd) who handled site drying. Furniture was moved and the carpet dried, while staff interleaved periodical pages and set them up for air-drying.

In December 1994 two Melbourne libraries suffered water damage following rain storms. The Library at the Yooralla Society of Victoria had

books damaged (approximately 200 were replaced and others discarded), and the carpet needed replacing. The Library at the National Herbarium was flooded when gutters proved to be incapable of coping with a heavy rainstorm. Water entered under the eaves, ran through lighting ducts across the library and soaked a large part of the collection. Although the library's valuable collection of periodicals was affected, the downpour missed the rare books collection. Luckily for the library, the rain storm happened at 4.30 in the afternoon, a time when all Herbarium staff were still on duty and were able to assist with mopping up and air-drying.

Over the Christmas break in 1994 water from a heavy rainstorm partially flooded a strong room in a government agency in Hobart. Some material was lost, but the rest was air-dried. Record storage was later improved. Later, in June 1995, the State Library of Tasmania suffered minor water damage when a shower drain backed up.

Since 1986 the Dixson Library at the University of New England has had a number of incidents, mostly water leaks. Because they had produced one of the first disaster plans in Australia and had a trained disaster recovery team, they were able to deal with these incidents promptly and efficiently.

Damage from Floodwaters

In September 1988 water seepage into the basement of the Supreme Court of Western Australia resulted in LISWA (Library and Information Service of Western Australia) being called on to assist. The LISWA disaster recovery plan was adopted as a model. Surface water was pumped out and forced ventilation of the vaults provided (pumping continued to be required throughout the operation). Because of the nature of the records, and Supreme Court sensitivity to the movement of the material, inventories were required to meet confidentiality assurances. Material was boxed and shipped to off-site fumigation facilities. Fumigation was done using ethylene oxide in a closed chamber. Because of the health implications of ethylene oxide, Health Department approval was sought and ongoing assistance was provided by them. When fumigation was completed, the material was unpacked and air-dried. Items were individually cleaned, repackaged and deposited in environmentally controlled storage. The initial 'disaster recovery' component began in September 1988 and took ten days to complete, while the project as a whole lasted for twelve months. An archival microfilm program is ongoing.[33]

There was heavy rain in western Queensland and in western New South Wales in 1990. In western Queensland the town of Charleville was particularly affected. Only one library, that of the high school, escaped damage. Jenny Cram quotes the Shire Clerk:

The water came through the town at 41 km an hour. It burst through the glass doors (of the public library), taking them off completely, and whirled around inside. All that is left is about 100 books which were on a high shelf attached to the wall.[34]

The libraries at the primary school, the pre-school, the school of distance education and the Catholic school were completely wiped out. Books, catalogues and furniture were lost. Cram realised that the widespread devastation meant that libraries would be fairly low on the list when available funds were allocated and advised that a Flood Fund was being established to help with restoration.

The story in western New South Wales was similar. Anne Gault of the Bogan Shire Library writes that, because of evacuation of the town, she was unable to inspect the damage for a week. She had expected, on previous experience, that the library would have escaped the flood waters, but she found: '...dirty brown carpet littered with sodden books, book-ends, and the odd toy and video case, with what was to become the very familiar smell of flood water, wet carpet, floor, and mould much in evidence.'[35]

She had notes provided by the State Library of New South Wales but was hampered by the lack of water and electricity and by the limited manpower available. She dried books on trestles in the open air. Drying the library was not possible until the carpet was taken up and power was restored. Many of the books restored have some degree of water staining and distorted boards, but, as Anne Gault (who is obviously a lateral thinker) says: '...any Library can offer books free of such defects but only we can offer genuine Bogan flood relicts!'^[36] The library was able to open for reduced hours but with all services available the weekend before residents were allowed to return permanently. Around 1400 books were written off.

Damage Caused by Burst or Faulty Pipes

Flooding may ensue from plumbing failures. In 1987 a burst pipe in the Carrington Municipal Library in Richmond, Victoria flooded three floors with damage to books, computers and archival records.

The Auckland City Council offices were flooded in 1988 when an expansion joint in hot water pipes on the seventh floor failed. Water cascaded down to flood the basement level. Pumps were able to handle the problem in the basement, and attention was directed to the upper floors. Engineering maps and plans were stored on the sixth floor, and some forty-five drawers were affected. Although freeze-drying was considered, a suitable facility was not available, and so the plans and maps were air-dried in a basement where mobile dehumidifiers had been installed. Most of the plans were only slightly wet at the edges. Bruce Symondson says:

It became clear that the plans should not be spread out or separated at all until they could be separated completely. Very little damage occurred when separating plans still set at the edges, as the dampness assisted separation.... If they had largely or entirely dried, damage was likely, therefore separation had to be very careful.... In contrast the relatively few plans which were wet over their entire surface could not be separated when wet. Initial attempts to do so resulted in tears....[37]

Symondson goes on to say that service to the public continued during this time. With this in view he took a pragmatic approach to minimising damage to the plans. If damage was restricted to areas of the plans not carrying information, then he was not greatly exercised by the odd bit of paper stuck to an adjoining plan. His concern was the availability of information. His final comment is: 'Unless you have a lot of resources or time you cannot return matters to what they were. A fair number of the Council's maps and plans are damaged, but the information loss is very slight.'[38]

Later in the year an air-conditioning pipe burst in the offices of the Commonwealth Department of Veterans' Affairs and flooded a large part of the Compensation Section. Some sixty personal case files were damaged. Assistance was sought from staff of Australian Archives. Most files were air-dried, although a few of the more severely damaged were frozen. These were later slightly thawed and then air-dried.

On Saturday 29 January 1994 library staff at the University of Auckland were advised that there had been a burst water pipe in a kitchen above the Architecture Library storage area. Although the flow of water had been reported at 9.00 am, it was 1.00 before the water could be turned off and 3.30 before library staff had been reached and arrived on the scene. At this point there were about three inches of water on the floor, and water was still coming through the ceiling. Staff immediately

arranged for a pump to remove the water and began removing stock. One problem was that some material had been stored in open boxes and water had accumulated in the bottom of the boxes. Once the obviously damaged material had been removed for air-drying, it became apparent that the volume was much greater than had been thought and that freeze-drying would be necessary. Brambles Record Management Ltd was contacted and arrived about 8.30 pm with a refrigeration truck and other supplies. At this point the water removal had been completed and a dehumidifier was in action. The material which had been removed was sorted into wet and dry and what remaining on the shelves was similarly marked. Packing was completed on the Monday, and around 250 cartons (containing some 3500 items) were transported to the National Library in Wellington for freeze-drying. The experience gained prompted the library to review and update its disaster plan.[39]

Fire from an Unknown Cause or from Apparent Equipment Failure

The Great Lakes Council building in Foster, New South Wales suffered smoke, water and fire damage in June 1988. The new library building was not yet in operation, but some 9000 new library books were held in storage awaiting transfer to the new facility. These were destroyed. Although the library did not have a disaster plan, library staff were aware of requirements and sought advice from the State Library of New South Wales and the Randwick Library. Staff were moved to rental accommodation while they rebuilt their stock, and the new library building was used by the Council for its technical and computer sections. The library has since developed contingency plans.[40]

In 1990 a fire on the floor above the library of the Exploration Information Centre at Santos Ltd in Adelaide triggered sprinklers and water percolated through the light fittings and down the wall into the library. Staff discovered the damage on arriving at work to be greeted by fire crews and administration staff. They called Artlab (a Division of the South Australian Department for the Arts and Cultural Development which provides conservation services) and, on their advice, removed and air-dried all damaged material.

In 1991 the main hall and supper room of the St Kilda Town Hall were gutted by fire while the rest of the three-storey complex was badly contaminated by smoke and water. Fischer Steamatic/BMS Cat, Australia were called in and removed all computer equipment to their computer cleaning facilities while the inside of the building was cleaned. Desks and

work stations were treated on an individual basis. The contents of all folders were hand-cleaned page by page. Seven days after the disaster council workers were able to start returning to their jobs.[41]

In April 1994 there was a fire in the Architectural Division of the West Australian Building Management Authority and a large collection of active files suffered severe damage. This damage consisted of severe charring to the edges of files, followed by water saturation. The material had been housed in open shelf suspension filing systems and had been strewn across the floor following fire fighting activity. While the files had no archival value, the content was necessary to support ongoing legal claims. The files were microfilmed in their wet stage and then destroyed.

On 30 August the same year the ground floor of the Knox Civic Centre in Victoria was gutted by fire. The fire occurred as the city's councillors were finishing a meeting, so immediate action was possible. The centre possessed a draft disaster plan and was able to implement it immediately. Fischer Steamatic/BMS Cat, Australia were called in to carry out salvage and restoration of the municipal records. The council was able to lease a nearby building and restore limited service very quickly. A feature of this disaster, which will be described later in this book, was that management made a video of the damage to show to council staff so that, even though they were unable to enter the site, they were fully aware of the extent of the fire and were able to comprehend more accurately the effect that the disaster would have upon them.

Later in November a computer monitor at the Torrens Valley Institute of TAFE, South Australia, caught fire resulting in the destruction of two computers, electric cabling, a desk, carpet and light fittings. While the area of fire was limited, the resulting smoke caused extensive damage as it was channelled through the air-conditioning system, and a thick layer of soot was widely spread. As the fire occurred in the last weeks of the school term, it was important to reopen the area as quickly as possible. Advice was sought from the State Library of South Australia and Fischer Steamatic/BMS Cat, Australia was called in to assist with restoration of the computers. A second fire occurred in similar circumstances two months later, but in this case in a small enclosed room where staff were present and were able to take immediate action. Subsequently the type of monitors in use was replaced and smoke detectors installed above all computers. This disaster is not uncommon and is similar to ones that have occurred overseas. Air-conditioning is vital for establishing a friendly environment for paper-based records and for computer systems, but, if preventive measures are not in place, it can increase the likelihood of a disaster spreading.

Arson and Vandalism

All too often damage is caused by the deliberate act of a vandal. In 1987 at the South Barwon Library vandals flooded the carpeted floor after they directed a fire hose through the return book chute.

In May 1987 a fire swept through the Maroubra Central Library in New South Wales. The fire apparently resulted from arson (transaction cards and books had been piled near the circulation desk and set alight), and it smouldered until local residents were alerted when heat blew out windows. There was much fire and soot damage but little water damage to the collection.[42]

In Sydney, Alan Howell, Conservator at the State Library of New South Wales, was called in to direct recovery from a fire which damaged a large collection of music scores. Some 20,000 popular music manuscripts from the mid-nineteenth to mid-twentieth centuries were damaged or lost. Howell has recorded that scores held on wooden shelving were charred to a depth of approximately 25mm, but the shelves, although charred to a similar depth, held together while metal shelving contorted and buckled, dumping material on the floor.[43] Although the entire collection was thoroughly soaked during the fire-fighting operations, residual heat in some of the metal shelves continued to ignite scores lying on the floor of the room. Material that was not too badly damaged was separated into damp, for air drying in a nearby warehouse, and wet, which was frozen. So that scores could be used in concerts to raise funds for the project, some of the frozen material was later thawed and air-dried. The larger portion was freeze-dried. The wide media coverage ensured a large group of volunteers came to help with the recovery, and supplies were also donated.

Eric Archer was involved in the recovery of material damaged by a fire at Wesley College in November 1989. Deliberately lit, the fire gutted the main building and severely damaged the library, which held rare Australian first release novels, archives and papers. Material from the disaster was sorted into wet and dry categories, and wet material was sent immediately for freezing. Dry and slightly damp material was taken to a nearby classroom and interleaved for air drying.

In Perth, Western Australia a break-in to the office area of the Department of Aboriginal Affairs in 1990 was followed by a fire, believed to be deliberately lit. While large quantities of carbon and oil residue were deposited throughout the main library area, the excessive amount produced (from the large quantity of plastic material in the office) did extinguish the fire as oxygen was rapidly depleted. In some parts of the library the carbon deposit was as deep as 10cm. As there was no

sprinkler system and no water used to extinguish the blaze, a different approach was used. Paul Malone says:

The material was treated by constructing a wind tunnel on site with a powerful vacuum on the exhaust side and high pressure air jet applied individually to the material on the negative side. Before removing the material from the shelves each book was individually clamped to prevent penetration of soot further into the text block. Plastic erasing material was applied as a final clean-up and the material boxed and removed...the 7000 items required 100 work hours to recover.[44]

Early in February the following year vandals turned on a fire hose in the State Library of Tasmania and water damage resulted to four bays of shelving. Approximately 300 items required treatment and were air-dried.

In July 1994 a fire in the Law Courts at Fremantle took place following a break and entry. There was no sprinkler system, and the majority of paper-based records were destroyed. What paper material did survive was extensively charred and water damaged. The material was air-dried, and, as the material was not required for permanent retention, damaged edges were removed.[45]

In 1995 an accountancy firm in Brisbane was broken into by an intruder who vandalised the offices and then set fire to the main repository in the building. The major damage to the 150,000 records was caused by heat and soot, while water damage affected only 2 per cent. Grant Collins, of the State Library of Queensland, was called in to direct the recovery. He set up and trained a team which then carried out the recovery. Soot was cleaned using Dry Chem sponges or, where damage was more severe, plastic erasers. Where there were records which had burnt edges, these edges were guillotined off. If it was apparent that a record would take more than a minute to treat, it was minimally cleaned and photocopied (unless there were legal requirements for the document to be in its original format). Folders and binders were replaced. The project was completed in four weeks.

Grant Collins was also called in to assist with a school library collection which had been damaged by fire and water following action by an arsonist. Approximately 20,000 items were damaged and volunteers had commenced work before Collins was brought in. Items were air-dried and cleaned of soot. The insurance company had arranged for a private company to carry out ozone treatment. The books were fanned out and placed in a mobile chamber. A stream of ozone was pumped in and the books left overnight. The aim of ozone treatment is to convert smoke

odours into carbon dioxide and water vapour. Collins advises that this claim was accurate for the materials treated in this case. He does note that ozone gas is known to accelerate the deterioration of paper fibre. He also registers a need to establish the stability of the residue impregnated into the chemical sponges and its effect on paper.

Explosion and Fire

There was an explosion in a transformer at an SEC substation in Melbourne on 24 March 1994. Thousands of litres of oil were held in tanks at the substation and these caught fire. The substation occupies the ground floor of a two-storey building; alarmingly, the Melbourne City Archives are located on the floor above. While the fire did not spread to the first floor, dense smoke travelled by way of stairwells, loading bays, ventilation systems, windows (and even structural cracks) into the Melbourne City Council Archives Repository. A heavy layer of soot was deposited on all surfaces. An examination showed that this fallout did not contain any toxic substances. A furniture clean was carried out by a cleaning company, and Eric Archer's company, Bracken Grange, tendered successfully for the contents clean. The contents clean involved the removal of soot from some 25,000 plans which were rolled but not in canisters and a large, but undefined, number of plans in 139 plan cabinet drawers. All plans were bagged and recorded. The team then unrolled each set of plans and cleaned them using non-chemical sponges. A considerable number of the plans had been rolled for many years and were difficult to unroll – the number of sheets in a single roll could vary from one to forty or more. The windows were a major route for soot penetration. Plan cabinets were located beneath the windows, and, even though all drawers had been closed at the time of the explosion, there was heavy soot deposit in some drawers. The clean was done on site and service to the public continued, requested plans receiving priority treatment. A team of three began work in April and completed their task in July. The Archives Repository still remains in its perilous location.

Structural Failure

At the end of 1987 the library of the Gippsland Institute of Advanced Education (now the Gippsland Campus of Monash University) suffered a shelving collapse. The shelves were subsequently braced to prevent a recurrence, but four years later a further shelving collapse occurred when

a single-sided bay of wide newspaper shelving collapsed. No one was hurt in the first collapse, but a staff member was slightly injured in the second.[46]

Earthquake

Late in 1989 libraries in the Newcastle area were affected by an earthquake which struck on 28 December. While the force of the earthquake (5.5 on the Richter scale) was not as great as many overseas earthquakes (Kobe in 1995 rated as 7.2), there was considerable damage, particularly to older buildings, and twelve people were killed. A medical library at the hospital site suffered water and structural damage. The Hunter Water Corporation suffered building damage and some shelving failure and the librarian narrowly escaped injury. The Auchmuty Library of the University of Newcastle also suffered shelving failure. Elizabeth Guilford reports:

The floors of four of the six main reading rooms were covered with thousands of books which had fallen from the shelves, together with hundreds of broken ceiling tiles and insulation batts. Other tiles were hanging from the ceiling with exposed wiring.... Fortunately the library was closed for the Christmas break and so possible injury to library users and staff was averted.[47]

Fortunately structural damage to the Auchmuty Library was relatively minor. The widespread damage and loss of life suffered by the city meant that some library staff in the city, as had been the case in Darwin, were required to cope with personal stress and trauma. The Hunter Valley Water Board examined the human impact of the earthquake on its employees. They found that a moderate number of their employees had experienced some psychological worries; they made counselling services available. Some members of the Water Board staff were involved in the rescue effort at the Newcastle Workers' Club, where most of those killed had been located.

Other Causes

A disaster recovery with a difference occurred in November 1994 when the Archives Office in Hobart was advised that a company had accidentally discarded some plans and documents. They had been dumped

in a skip and had suffered overnight water damage. Approximately 12,560 items were brought to the Berriedale Repository where they were air-dried and cleaned.

An Incomplete Record of Disasters in Australia and New Zealand

This cannot be a complete record of the disasters which have occurred in the two countries. There is at least one disaster of which the author has personal knowledge which is not described here; none of the staff involved is still at that institution, and current staff do not feel they have information to impart. Damage to libraries, archives and commercial records is not always reported, especially if it occurred as part of a major disaster. Those who have been involved in a disaster may not have wished to form part of this project, perhaps because the experience was traumatic for them, or perhaps because they fear that their response to the disaster could warrant criticism. They may have gone on to other matters so that the disaster is no longer a matter of immediacy for them. For whatever reason, it is accepted that there are disasters not here reported.

Tamara Lavencic has run many training courses in disaster recovery and through these courses has acquired information about 'unreported' disasters. She has written:

...it is obvious that the most common causes of disasters are from what could be termed 'technological or mechanical hazards', that is: air-conditioning failure, structural leaks and humidity control failure to name but a few.... From a simple survey of unreported incidents that I started in April 1995, 38 percent were attributable to roof leaks, 24 percent to blocked drains/gutters, 14 percent to burst pipes, 9 percent to fire and 5 percent each to floods, sprinklers and leaking window seals. These figures were collected from disaster workshop participants, who are more likely to be attending because their organisation has experienced some related damage in the past.... Of these disasters 60 percent fell into a minor damage category (less than 20 shelves of material affected) and 40 percent into the greater than 20 shelves affected category.[48]

She goes on to compare these figures with an early compilation of information for this book:

Of 50 reported 'incidents', 18 were fire-related (36 percent), 8 were flood related (16 percent), 6 other cases of water damage did not specify the source of the water (12 percent), 5 were related to rainstorms (10 percent), 3 were attributed to roof leaks (6 percent), and the others one report each for the following: generator explosion, leaking pipe, earthquake, water seepage, shelving collapse, burst pipe, a fire hose down a book chute, vandalism, cyclone, and dropping a crate of books in the sea.[49]

Lavrencic adds: 'It appears that what is common knowledge is not recorded in the public domain.'[50] She believes that people are more willing to report a disaster if the reason is seen as being beyond their control. If the disaster was caused by equipment or building failure, then there is an element of embarrassment; but if the disaster was caused by natural forces or by vandalism, then it was no one's fault! It should be noted, incidentally, that, while the figures Lavrencic quotes have been updated (the final count was over 60), the ratios have remained constant.

The reports on which this chapter has been based vary in detail; a serious disaster may receive a quite cursory report, while a less severe one may have been reported in excellent detail. Where this has happened, it has, of necessity, been reflected in the account given here. Many reports do not establish exactly when the disaster happened. Of those that do, a considerable number happen on weekends, public holidays or overnight. Those caused by vandalism or arson, of course, are likely to have occurred when staff are not present. Where the disaster is from natural causes or equipment failure, this is probably because an 'incident' may not develop into a 'disaster' if staff are on hand. A quite minor leak developing at night may have caused extensive damage by the time staff arrive in the morning. This is not to say that a burst pipe occurring in the daytime can be contained quickly. In 1988 a staff member at the Vancouver Public Library, British Columbia was nearby when a four-inch pipe fractured and water jetted into the library (it was the noise that alerted her). It took ten minutes for the water to be turned off, and in that time 48,000 gallons of water flooded two levels of the library.[51] If that pipe had burst overnight when no staff had been present, the result would have been even more catastrophic.

Frequently the damage has been caused by water used to fight a fire, but this is the lesser of two evils. Dealing with wet material is preferable to dealing with something that has been burnt; at least wet items can be treated and restored to a usable condition. Most of the disasters reported were single site disasters, but at least fifteen libraries suffered as the result of area-wide disasters: floods in Maitland, Brisbane, western

Queensland and western New South Wales, the Ash Wednesday bushfires and the Newcastle earthquake.

Disasters may be caused by nature, by equipment failure, by carelessness or by deliberate malice. It is possible that a disaster may be unavoidable; it is more likely that its occurrence can be at least mitigated, or at best prevented. If, despite all precautions, a disaster does occur, then quick, informed action can limit the effects and hasten recovery.

Reaction to Disaster in Australia and New Zealand

It has been noted that the early reaction to disaster was to replace damaged material; there was, apparently, little thought of salvage and recovery. McGregor and Bruce applied recovery techniques after the Brisbane flood, and similar action took place after Cyclone Tracy. In 1978 the then Canberra College of Advanced Education (CAE) began offering a conservation course which included a segment on disaster recovery. A segment is currently included in courses at the Queensland University of Technology.

Apart from the Canberra CAE course, the first organised approach to disaster recovery in this region was initiated by Tony Clarke at the Museum of New Zealand. In 1979 conservators in New Zealand met in Wellington to discuss the setting up of a local conservation organisation. One of the aims of this organisation was to form a disaster unit with the intention of rendering first aid to collections affected by disaster. Tony Clarke notes that the prevalence of timber buildings in New Zealand made the danger from fires high, while earthquake, storm and flood are also likely. He quotes a report that the Wellington area must '..expect to be periodically subjected to earthquake shaking of the highest intensity'. [52] Most of those attending the meeting had experience of minor disasters.

With training, our members became aware of what to look for when a minor disaster occurs. For example, water damage can go undetected in places like storerooms and library stacks because water often runs down walls hidden by the shelving. Obvious puddles of water are usually mopped up – if noticed – but any water taken up by the objects or books stored on the shelves very soon encourages mould growth if left undetected. Pockets of stagnant air behind the stacks become saturated with moisture and when the relative humidity rises above 68% mould will begin to appear....[53]

The organisation prepared a recommended disaster kit, and training courses were set in train. Members of the organisation were later called on to help following a fire in an art auctioneer's warehouse, as well as floods affecting a small house museum, and on another occasion the records of a hospital, which had been stored in a basement, as well as drawings and plans that had been under water for twelve hours. Luckily they were in closed drawer units which protected them from oil and sewage released by flood waters. A later experience with water damage in the National Art Gallery and Museum following a storm highlighted possible problems occurring when untrained volunteers operate on their own initiative. Clarke remembers:

A second team of untrained enthusiastic volunteers moved objects without the curator's knowledge. Fortunately they were careful and no damage was done. This time we were lucky but it clearly emphasised the importance of the curator's presence in order to determine priorities and avoid unnecessary confusion later, and possible damage to the collection.[54]

Sally Buchanan's visit to Australia stirred interest, and, after the seminar in Melbourne in which she and Jan Lyall discussed the National Library fire and disaster recovery in general, CAVAL Ltd (Cooperative Action by Victorian Academic Libraries) formed a committee (under the chairmanship of Max Borchardt) whose name, after some vicissitudes, finally settled as the CAVAL Disaster Management Group. In the intervening years the group has developed disaster plans for its members, culminating in the production of a disaster plan on disk;[55] it has run three major disaster recovery workshops and sponsored smaller library-specific training sessions. It has also produced an Australian version of the National Library of Scotland's *Planning Manual for Disaster Control for Scottish Libraries and Record Offices*.[56] The Australian version was entitled *Disaster in Libraries: Prevention and Control* and has appeared in two editions.[57]

Around the same time as the CAVAL Disaster Management Group was formed a Disaster Management Committee was established at the State Library of New South Wales. The Committee began work on a Disaster Plan which they published in 1987.[58] Karl Schmude, University Librarian at the University of New England, wrote an article in *InCite* in which he recommended the basics of a disaster plan,[59] and the University of New England Library began work on a disaster plan which also appeared in 1987.

In the intervening years the State Library of New South Wales has run many disaster recovery workshops. In Queensland disaster seminars were held after the 1990 floods. Organised by the Queensland Branch of the Australian Archives, the sessions have changed and evolved over the years. Instructors have developed a flexible format to accommodate time and space restrictions and the logistics of setting up a simulated disaster scene at an unfamiliar site.'[60]

Australian Support for Asia-Pacific Region

A number of Australian organisations and individuals are involved in supporting the development of disaster planning and response capabilities in the Asia-Pacific region.

APACA (Australian Preservation and Conservation Abroad) group is a national grouping of the leading federal and state cultural institutions and agencies, laboratories and educational institutions involved in coordinating effective Australian conservation and preservation and developmental cooperation in the region. Its principal role in the disaster management field is in the coordination of information and in acting as a liaison mechanism in supporting the development of disaster planning and response capabilities and in routing requests for assistance in emergency situations.

APACA works with PREMO (Preservation in Museums of Oceania), the ICCROM-initiated organisation of Pacific Island museums and cultural centres. Guy Petherbridge notes:

In a region variously prone to cyclones, typhoons, torrential rainstorms, volcanic eruptions and earthquakes, PREMO has identified disaster management as one of its key priorities. Its first two annual pan-Pacific conferences in Palau (1993) and New Caledonia (1994) had a key focus on training personnel in this field, in the development of consistent disaster plans for each member institution and in regional strategic support mechanisms. In the latter context, plans are being developed and incorporated into regional counter-emergency infrastructures, whereby under-resourced nations may draw on countries like Australia and New Zealand for assistance in the event of disasters in cultural institutions. This might be in the form of specialist teams and equipment flown to disaster stricken locations or evacuation of material to facilities, such as freeze-drying and humidity control laboratories elsewhere.

...Otherwise, individuals and individual organisations, such as Guy Petherbridge of the Australian Archives (who undertook a UNESCO mission in 1995 to advise and conduct a seminar on national disaster management strategies for cultural institutions in Malaysia), and the National Film and Sound Archive (who are involved in the development in the new South East Asia Pacific Audio Visual Archives Association and training programmes in the Philippines and elsewhere) are helping to develop regional capabilities in both the ASEAN countries and the Pacific.[61]

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2 Management Issues in Disaster Recovery Planning

Disaster: a sudden calamitous event producing great material damage, loss and distress.[1]

Is 'disaster' seen in terms of *scale*? There is a tendency to equate 'disaster' with 'catastrophe'. Cyclone Tracy was, without doubt, a disaster, but a leak affecting one shelf of material is thought of as something different – an unfortunate occurrence perhaps, one which may cause a lot of trouble but not a *disaster*.

Whether an event is a disaster or not depends on the effect which it creates. A 'disaster', then, can be anything from a water leak affecting one shelf of books or one drawer of a filing cabinet through to the total destruction of an institution or even a city. Conversely, it could be argued that the flooding of a room holding material to be discarded is *not* a disaster. Consider some possibilities:

A catastrophe which totally destroys an institution is clearly a disaster.
One leak which destroys the contents of one filing cabinet will also be a disaster if that cabinet contains vital documents. Such a loss may lay a company open to severe financial loss or even legal action if these documents affect clients.

A disaster that damages one room may destroy materials needed for research or for students at a critical point in their studies. This is a disaster for those students.

Water damage may destroy a very small number of items but those items may be part of the national heritage.

Care can be taken to prevent many disasters but some cannot reasonably be foreseen. Newcastle, for example, had no reason to expect an earthquake. Northern Australia, however, can expect cyclones and the southern states can expect bushfires. Most disasters are in the realms of

possibility. No institution can rule out the possibility of fire. If a fire does occur, then it is highly likely that water will be used to extinguish it. As in the case of Santos Ltd fire may occur on the floor above, but sprinklers or the water used to fight the fire may severely damage the floor below. Water damage may occur in its own right as pipes leak and water mains burst. The institution may believe that all is secure, but human carelessness may leave a tap running or let a hot water urn boil dry. That such events have never happened is no guarantee that they will not happen tomorrow. People talk of 100 year floods, that is, floods with an average return period of 100 years. The likelihood of a flood may be slight, but consider, this is an estimate: the 100 years may come up next week.

No institution can afford to ignore the possibility of disaster, and such a disaster can be crippling. Helene Donnelly is a disaster recovery consultant in England and the founder of the Data and Archival Damage Control Centre. She says:

In reviewing our case files we discovered that over the last eight years 16% of our clients have had some form of legal action following a fire, flood or bombing in which information has been partially or totally destroyed. 45% of these clients have had legal confrontations in the last two years.[2]

She goes on to say that companies need to protect themselves legally for the future when documentation and information have been partially or totally destroyed in a disaster. She is speaking here of the need for careful documentation of the results of disaster. If this is not done, then the company must rely on the memories of staff (who may leave) or the hopeful assumption that 'it was probably lost in the fire', and this will not satisfy customer requirements. Her basic point, that the effects of disaster can be crippling long after the visible signs have disappeared, is one that all institutions, whether corporate or academic, should keep in mind.

Although Helene Donnelly works with disasters of all kinds, she is speaking specifically of business files here. Current records management deals not only with paper-based records but also with electronic and photographic media. There are fire-resistant cabinets, but they are just that – *resistant*. Contents may still be subjected to high temperatures and this may damage both electronic and photographic media. Materials may have been stored in vaults but, all too often, these are located in basements that may not be waterproof – the aim may have been to provide security against break-ins rather than disasters.[3] Part of the problem in the Florence flood was that much material had been stored in basements

during the Second World War as a safety measure against bombs and shelling. What was a valid protection against one kind of disaster provided no safeguard against a different threat. A frequent source of disasters has been building renovation. It has, on occasion, been difficult to get people unfamiliar with the needs of the operation *not* to smoke, *not* to prop open safety doors, *not* to leave debris and *not* to punch holes in places where rain or water can penetrate or drain. In one case air-conditioning was improperly disconnected and builders' dust was sucked through into the library where it settled as a thick coating on the collection and over the reading room.

Disaster recovery planning is not just a matter of reacting to an emergency after it has happened. It calls, initially, for a detailed analysis of the purpose of the institution, its contents and its practices.

What Is a Disaster Recovery Plan?

A disaster recovery plan seeks to prevent a disaster occurring, but, if such prevention fails, it sets out how best to recover from that situation. Such a recovery will include salvage and restoration of damaged material. Damaged material will be inspected and informed decisions made for appropriate treatment, whether this be done in-house or referred for commercial treatment, and whether the items are best discarded and replaced. The disaster site will need to be restored. While all this is happening, the institution will need to think about establishing an interim service for its clients. At the end of the project (which may take weeks or months) a full report of the disaster and its outcome will need to be made.

While disaster recovery is linked to evacuation and fire fighting, it is best if the plans covering these actions are kept in separate documents. No matter how valuable artefacts are, they come second to the safety of people. Instructions for evacuation should be brief, to the point and known intimately *by all staff*. These instructions should not be obscured by information which individual staff members feel will never apply to them. Fire and evacuation information can usually be compressed into simple, graphic documents which can be posted in offices or at appropriate places elsewhere in the institution. A disaster recovery plan is, of necessity, more detailed and more complex than an evacuation plan, although, as will be discussed in the following chapter, every effort must be made to make it clear and straightforward. The person controlling an evacuation is not necessarily the person controlling the disaster recovery. Evacuation and disaster recovery plans for the one institution should,

however, be consistent: for example, emergency contacts should be the same.

Management of the Plan

When senior management decides to establish a disaster plan, careful consideration should be given to the staff member given this responsibility. In a small institution an outside consultant might be brought in to develop the plan, or adjacent institutions might decide to collaborate in plan production with a person external to at least one of the institutions developing the plan. Where the plan is to be developed internally (and this is desirable for the local knowledge and, it is hoped, commitment that a member of staff will bring to the task), the person selected should be of sufficient seniority to negotiate with senior staff both inside and outside the institution. He or she should have interest and enthusiasm and be prepared to assume responsibility. It should not go to a staff member just because that member is not fully employed; conversely it should not go to a senior staff member who is unable to give the project the time it deserves. Although the role might be seen as having some connection to a particular range of duties, collection management, say, or responsibility for the building, this should not override consideration of the personal qualities of the staff member concerned.

The Disaster Controller will be required to coordinate activities in what may be a traumatic situation; leadership, calmness and the ability to think effectively on his feet are crucial. If this is not the person whose duties are seen as related (that is, collection management or site responsibility), then that person can still fill an important role as the Evaluator (see Chapter 3) or as a subject expert. Having selected the Disaster Controller, senior management should be prepared to delegate responsibility to that person. Obviously, he will make regular briefings to senior management while compiling the plan, and the completed plan must be acceptable to management. The Disaster Controller will need to negotiate with staff in the wider institution and must be accepted by the wider institution as being the staff member responsible in the case of a disaster. If the wider institution has a disaster plan, then the library or records plan will form a segment of that overall plan and should be compatible with it.

Scenario 1. Responsibilities of the Disaster Controller

The Serials Librarian has inherited the role of Disaster Controller following the departure of the Deputy Librarian, who set up the plan and ran the original training sessions. The Serials Librarian was selected, in all honesty, because the staff member who was the Chief Librarian's first choice is currently fully occupied by the installation of a new automated system. Once installation is completed and staff have been trained, the Chief Librarian expects to review the role of Disaster Controller. The task of disaster recovery is not one which the Serials Librarian finds particularly interesting and she is, in any case, fully involved in her existing duties. She has the Disaster Recovery Manual on her desk and a copy at home, but apart from reading it when first appointed Disaster Controller she has not spent any further time on it. When notified of the disaster (a fire caused by arson and extinguished by the Fire Brigade), she arrives at the site with the manual.

Her first problem arises when she attempts to call in members of the recovery team and finds that one is no longer on the number given (this problem recurs later in the recovery when a member of the team is attempting to locate supplies and finds that one supplier has apparently gone out of business). When allowed to enter, she inspects the site but realises that the priority listing is out of date as installation of the automated system has led to some relocations and other items are located where priority material was once shelved. Because there have been no training sessions since the previous Disaster Controller left, the recovery team is also rather 'rusty'. The recovery is completed, but it is a stress-laden and unhappy experience.

What Should Have Happened

The major problem here is that the Serials Librarian did not take her responsibilities seriously. She was not familiar enough with her duties to register that she must review the plan on a regular basis – and certainly be alert to changes in the physical location of items which appear to affect the priority listings. Being able to contact the recovery team is vital, and she should have ensured that she is advised of any changes in telephone numbers. She should also be reviewing her external contact numbers. She should

certainly have, at the very least, met with the recovery team and discussed the plan. Ideally she should have run training sessions. The recovery team will expect the Disaster Controller to know what she is doing, and obvious lack of knowledge will not maintain the morale of the team.

The Chief Librarian is also at fault here. How did he brief the Serials Librarian? Did he impress the importance of her role upon her? Did he feel that she had the time to devote to the task? Did she know that she was a temporary, and second best, appointment?

The Disaster Controller should have a committee to assist in designing the plan. The more widely it is understood, the more widely it will be accepted. In the event of a disaster the Disaster Controller will control the recovery process. The question of a backup Disaster Controller can be a difficult one. Murphy's Law is likely to ensure that the disaster occurs when the Disaster Controller is on leave and the designated backup is ill. Probably a pool of backup staff is best; all backup staff will have been through a training program and will have copies of the plan. In the event of a disaster at which the Disaster Controller is present these backup staff can head the various recovery teams, but they should *all* be capable of directing a recovery. If the institution is a small one with few staff, the head of the department will probably have to wear more than one hat and may need to ensure that all staff are trained to be backups and that outside support is available.

Senior management remain the public voice of the institution and will liaise with the media. Once the plan is established the Disaster Controller will be responsible for training staff (this is discussed in a later chapter).

Insurance and Financial Aspects

Disaster recovery can be a very expensive business. Management will need to take into account a number of possible costs:

- * replacement of items irretrievably damaged or more economically replaced than restored; keep in mind that this cost will also need to cover staff time taken in ordering and processing those replacements;
- * cost of freezing and storage of retrievable items and cost of freeze-drying those items;

- * cost of the interruption to business;
- * cost of employing a commercial disaster recovery firm;
- * cost of supplies which will be needed to address the recovery;
- * cost of drying/replacing carpets and furniture/equipment;
- * cost of restoration of the disaster site;
- * cost of hiring temporary quarters for air-drying;
- * cost of hiring temporary space for interim or ongoing service;
- * cost of staff overtime and/or hiring of temporary staff.

Obviously not all of these will apply to any one disaster, but all are possible. The institution should investigate the likely cost of these items and discuss coverage with the insurer. If the institution decides not to pursue coverage for a particular item, then it should be on the basis of an informed assessment and in the knowledge that such costs will need to be borne by the institution's operating budget.

In addition to establishing the appropriate coverage the Disaster Controller should discuss the Disaster Plan with the insurer. It is important that recovery begin as soon as possible. The Disaster Plan will indicate that the disaster site be photographed (or video-ed) in its original condition, and permission should be sought to commence any recovery as soon as possible. The arguing point for this is that the sooner recovery begins, the less any claim is likely to be. Even if the insurer is unwilling to give a guarantee of this kind, he may undertake to guarantee rapid attendance by an assessor. Whatever agreement is reached should be a written one with a copy placed in the Disaster Manual. Keep in mind that, if there is a disaster, the more detailed and complete the record of the disaster is, the easier the path through the insurance claim procedure will be.

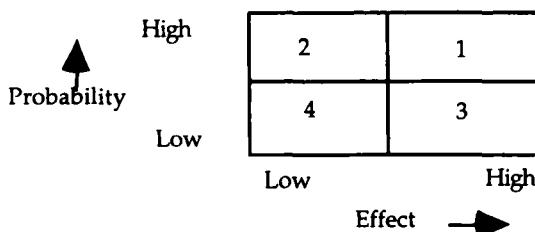
Emergency Funds

Regardless of what insurance arrangements are made, consideration must be given to the availability of emergency funds. If, for example, the rolls of paper towels in the disaster bin (see Chapter 3) are exhausted and a staff member must go to the nearest supermarket to buy more, how will that staff member pay for them, or how will that staff member be reimbursed? What if fans, wet/dry vacuum cleaners and dehumidifiers must be hired? Who has the authority to commit the institution to this expenditure? If the supplier wants pre-payment, who can do this? Someone, eventually, will be accountable for this expenditure.

Risk Analysis and Prevention

It is obviously better to avoid the disaster in the first place. The first step is to identify likely sources of disaster. Certain locations have known threats: New Zealand has frequent earthquakes, Northern Australia is subject to cyclones. Other areas may have potential threats: a town may be located by a river, and businesses in that town should be aware that heavy rain in nearby mountains may result in local flooding – as happened in Florence and in Corning. Such a flood may not have happened in living memory, but this is no guarantee that it will not happen next year. Other institutions may be located in areas experiencing a high crime rate. Vandalism may be a problem. The likelihood of such occurrences should be assessed and the following method can be of value.

In this diagram number 1 represents occurrences with the greatest risk and 4 those with the least risk.



Risk analysis will identify those occurrences which will impose the greatest threat to the organisation and its collections. Once the analysis is completed, then steps can be taken to eliminate those risks, or, if this cannot be done, to minimise their effect.

<i>Category</i>	<i>Probability and effect</i>	<i>Examples</i>
1	High probability, high effect	Fire, cyclone, civil unrest, flood, earthquake, burst water main
2	High probability, low effect	Leaking tap, vandalism

3	Low probability, high effect	Cyclone, nuclear war, civil unrest
4	Low probability, low effect	Shelving collapse[4]

The same threat may vary in intensity in similar areas. For example, a municipal library on low land close to a river would see 'flood' as a category 1 risk, while a records repository on the second floor in the same city might not. The Melbourne City Archives, whose soot damage was described in an earlier chapter, could have identified 'fire' as a category 1 risk. A university library on a campus with a history of student unrest could well see 'vandalism' as, at least, a category 2 and probably a category 1 risk. Cyclones will be a Category 1 risk in Cairns but would not be considered in Melbourne. Some risks, of course, cannot be foreseen. It is unlikely that any library in Newcastle would have considered 'earthquake' as part of their risk assessment; Wellington, on the other hand, would see earthquakes as a category 1.

Once this risk analysis has been carried out, the next step is to examine the building and the organisation involved.

- * The *physical environment* in which the organisation operates:
What is the building construction? what are the finishes? the curtains? the floor covering? how is the building heated? cooled? What is the internal arrangement of the building? are stairwells and lifts enclosed? are there mezzanines?
- * Are *hazardous* materials held?
Government regulations may require that significant holdings of hazardous materials are recorded at the building entrance. There may, however, be small amounts of solvents or other flammable materials held within particular working areas. If so, their presence should be recorded in the plan and the recovery team advised.
- * What is the *access* to the building?
How many hours per week is the building open? Who has access and to what areas? staff? the public? How is this monitored?
- * What *alarms* are provided?
Fire? Burglar? Water? What extinguishers or sprinkler systems are there? Do water pipes, heating systems or kitchens impose any potential flooding problems? Are guttering, spouting and skylights secure?
- * What *insurance* is held? and, finally,

- * Are safe working practices in place?
What checks are made at closing? How is maintenance work monitored? Is the issue of keys monitored and recorded? Is vandalism identified and repaired quickly? Is emergency equipment operational, signposted and not obstructed? Do staff know how to use emergency equipment? Are exits clear (storage of items in exits or passages is not permissible even on a temporary basis – evacuation may occur at any time)? Are regular safety checks of the building carried out?

Many checklists are available to help in carrying out this review; one is *Checklist for Disaster Prevention and Protection*, prepared by Lisa Fox for SOLINET; another, which appears in the CAVAL *Disaster Plan*, was originally prepared by the Iowa State Library Commission.[5] Others may be found included in disaster plans on the Internet, e.g., that of the University of California at Davis.[6]

Detection and Reaction Systems

The building must have smoke detectors and a sprinkler system. Sprinkler systems may be of the 'wet pipe' kind where the pipes are constantly filled with water, or the 'dry pipe' kind where the water is kept at bay in the pipes by pressurised air or nitrogen until the sprinkler head is triggered, the air escapes and water flows through the pipes. Consideration may be given to water alarm systems. Very Early Smoke Detection (VESDA) has been used by many organisations and appears very successful. VESDA continually draws samples from the monitored space and filters out airborne dirt and dust particles into an optical sampling chamber. The end result is a signal which is processed to represent the level of pollution (smoke) in the air sample.[7] It is possible for VESDA to be connected to the Fire Brigade, or, as in the case of the National Library of New Zealand, the institution may decide to have a first level of control within its own organisation. In the past Halon flooding systems have been used in areas of particular sensitivity, but this gas has now been phased out because of its threat to the ozone layer.

While there is yet no agreed replacement for Halon, there are encouraging reports of fine water or micromist.

At this time, a promising technology for the replacement of Halon involves the use of fine water fog (micromist). Micromist essentially involves the release of water at exceptionally high

discharge pressures (approx. 1000 psi), thereby creating a fog within the protected area. The result is a high efficiency cooling operation which has demonstrated fire control using significantly less water than comparable sprinklers. Initial tests on mocked-up hotel situations have produced fire extinguishment with less than 2 gallons of water, compared to 20-40 gallons per minute for standard sprinklers. As an added benefit, the water saturation commonly associated with standard fire sprinkler discharge is avoided.

Among the areas where micromist appears to be viable is in water sensitive applications such as fine art galleries, natural history exhibition areas, archival centers, and collection vaults. Computer and telecommunications rooms are also expected to be within the suppression capabilities of micromist.[8]

At the Re-Defining Disasters conference B.M. Lee discussed a system called INERGEN. This system introduces carbon dioxide and another inert gas to the confined space to lower its oxygen content. This will extinguish surface fires while not being injurious to humans.[9] This system is also still in the developmental stage. Until a suitable system has been accepted institutions should rely on smoke detection and sprinkler systems together with sound housekeeping practices: storage of valuable items in fire resistant cabinets, encasing papers and plans in boxes or tubes, banning smoking and seeing that rubbish does not accumulate. If vandalism is encountered, it should be repaired quickly; vandalism which is allowed to remain uncorrected sends a clear signal to the vandal. A particular problem may be encountered with fire doors; ideally the doors will open automatically on the triggering of the evacuation signal but be locked at all other times. If this cannot be done, an alarm should be fitted to the door so that unauthorised exits (or entrances by tradesmen) can be followed up immediately. Staff should *never* be allowed to use an emergency exit for the convenient movement of materials. The exceptional occurrence has a tendency to become the usual practice.

There should be a very careful inspection of the building and the identification, and rectification, of any faults found. It may be that such an examination will identify potential hazards which it is not possible (for financial or other reasons) to rectify for a period of time. This is not to suggest that the faults remain unaddressed, but they can be fed into the budget process and dealt with over time. In this case it is essential that regular checks be made of the potential hazard: for example, if a skylight is seen as a potential hazard, it should be checked during or after heavy rain; items, if possible, should not be stored beneath it; and plastic

sheeting should be available for covering shelving, cabinets, etc. At the most basic level a bucket can sit beneath the potential leak! Some useful techniques can be adopted; in the National Library of New Zealand the shelving canopies have gutters which divert water away from the books shelved beneath (it was found that water tended to curve in and fall upon the books below).[10] Another New Zealand innovation was developed by Tony Clarke who placed polythene sheeting on the shelf canopy so that, in the event of water damage, it could be lowered immediately to protect material on the shelves beneath.[11] He notes that this sheeting may also be used to protect the collection from dust when, for instance, tradesmen are working nearby. The National Library of New Zealand was also built to be resistant to earthquakes and Jeavons Baillie has written of this:

The building is designed to withstand very strong earthquakes to ensure that the collections stored there are adequately protected. To further this objective the services in the building are similarly designed to withstand such an event.

This is achieved in part by isolating any duct work, pipes or trunking from any wall or floor penetration. Gaps are left and where a clean appearance is necessary a light readily broken escutcheon is attached. This presented major problems for plant noise suppression.

The stairs are attached only at the landings at four points, only two of which are rigid. There is a large clearance to allow movement without crushing by the walls. A light metal plate fills the gap at each landing.[12]

Most institutions these days are at least partly computerised, and a conscientious backing up of records must be followed. If the institution is multisite and is connected by a local area network, backups can be made to a separate site. There are commercial companies who will provide a remote storage service. Miriam Kahn has written of a fire at Bankers Trust in New York. The fire did little damage, but traders and the library had to relocate until asbestos was removed and the damage repaired. Luckily the library staff had computers in their homes and were able to provide service from these locations until a temporary central site could be established. She notes:

What would the Information Center do differently? Keep rolodexes at home. Store updated manuals and documentation for databases in an alternate location, together with passwords, macros

and necessary phone numbers. Set up comparable computer systems in some staff members' homes to provide temporary information services.[13]

A similar problem was faced by tenants in the World Trade Center, New York, following the bombing in February 1993. One company, Guy Carpenter, had learned from a previous fire in a branch office the year before and had developed a priority system and mainframe backup. The librarian later commented:

...I would recommend that each library maintain good records off-site, especially of IDs and serial numbers for their hardware, passwords and telephone numbers of major online companies. Back-up disks, rolodexes and library directories are essential.[14]

Management should give careful thought to their computer system and to its linkages to establish the best backup system for their vital records. Staff should also be reminded that a conscientious backup program is no use if the backup disks are kept in the same office![15]

Standards for Records Management

Records managers in Australia should be aware of the recently published Standards Australia title, *Records Management* (AS 4390.6-1996), particularly Part 6: *Storage*.[16] This publication discusses: characteristics of a storage facility, characteristics of records, preservation and protective storage and characteristics of services and processes. It includes a useful worksheet for assessing storage requirements as well as a chart delineating the environmental conditions, safety and protection standards for storage of permanent and long-term temporary value Commonwealth records. There is also a brief discussion of the contents of a model disaster response plan.

Continuing Provision of Service

A major consideration for the librarian, archivist or records manager is the restoration and continuation of service. If the service is unavailable, there may be significant financial loss to the parent institution and its clients. It may seriously disadvantage students and researchers, or it may deprive people under some stress of needed relief. This last point is not one which

should be underestimated; remember, the Darwin library provided recreational reading for people involved in the disaster recovery following Cyclone Tracy.

Generally, there will be initial sympathy from those who use the service. This sympathy may be lost once the absence of that service hits home – especially if the users cannot see an effective recovery in progress. From a purely pragmatic point of view this initial sympathy has value. It may lead to practical assistance (remember, the Lockheed Company donated its freeze-drying capability to the Stanford Meyer Library), while its loss will add a further burden to those seeking to restore service and may spur clients to the sort of legal action which Helene Donnelly describes.

The service may well be quite limited; the institution should look to see where its greatest demand exists and establish a contingency plan for a partial continuation. In a library, somewhere for users to return books could be the first step, followed, perhaps, by a limited enquiry service. In an academic library the restoration of the Reserve Collection of recommended texts should go some way to reassure the student body. In the Melbourne City Archives and the Auckland City Council Archives recovery service continued and items needed were cleaned and supplied on demand. As in the New York examples, some service may be provided from remote locations. While the Disaster Controller will need to be involved in the discussions establishing such a service, its setting up should, if possible, be done by someone else. The Disaster Controller will have quite enough to do already.

Management of Staff and Their Safety

If the disaster is community-wide, staff will have personal problems to deal with if their homes and families are under threat. They may not be available, or there may be other demands upon their time. A log of calls maintained at a Los Angeles library after the earthquake of 1994 covered such matters as children to be collected from a school which had closed early, parents calling from interstate to enquire after the safety of family members on the staff, a baby sitter seeking advice as well as word of a pet which had fled in panic. Some of these matters may seem minor to the Disaster Controller faced with a major recovery, but they will be significant concerns for the staff involved. If the disaster is a major one or of an area-wide nature, then staff may be under significant stress. The support required may vary, and management should be alert to the problems which may occur. It is possible that professional counselling

may be required when the disaster is over. Ruth Wraith and Rob Gordon have written:

...the stress of the disaster experience and the lengthy recovery process can be expected to have its effects on all of those involved. These problems are in the nature of normal reactions to an abnormal situation. However these reactions need to be understood. Most people will need extra help during the recovery period, even if only from family and friends. If these response-appropriate reactions are understood and recognised, they can be anticipated and dealt with before they develop into more serious problems, or cause major interferences to the ongoing events or regular life, such as child rearing and marriage.[17]

There may be circumstances which threaten health. If the disaster involves flood waters, it is highly likely that the water may be contaminated by sewage, garbage and decaying matter. Even though access will not be permitted until emergency services judge it to be safe, staff must take care to wear protective clothing and be careful when eating and drinking.

In any case staff involved in the disaster recovery must be monitored. For example:

- * they should not be allowed into areas which may not be safe;
- * they must wear appropriate clothing;
- * they must not be allowed to drive themselves too far;
- * their input must be encouraged;
- * they must be fully informed of the progress of the recovery;
- * they must have rest breaks, and they must be provided with refreshments.

Staff enthusiasm may be high in the early days, but the experience of many involved in disaster recovery has been that such enthusiasm will wane as time goes by, especially if the staff are from areas not immediately involved in the disaster. As Kathleen Coleridge said after the Victoria University Library flood:

One thing we would do differently, should we have a repeat experience, is to spell out to *all* affected staff how long the clearing-up process was likely to take. Not all staff grasped how long the disruption would continue and their anxieties were apparent as the third, and then the fourth, week passed.[18]

Scenario 2. Staff Morale

There was a fire on the top floor of the south wing (caused by an electrical fault accompanied by an explosion). The ceiling and roof were extensively damaged. Although some material was lost through fire, water, smoke and soot damage have been extensive. There was no sprinkler system and fire hoses were played upon the roof. This resulted in water damage through the wing. The disaster plan has been followed, priority material has been identified, and appropriate treatment has been decided. Some material has been packed to go off site for freezing and subsequent freeze-drying. Staff have been handling material for air-drying. Material has been brought to an adjoining hall and staff are interleaving damp books, setting up rows of books for drying and checking the process of drying. The books are smelly and some are smoke and soot damaged. Staff are wearing rubber gloves and protective clothing but are still getting quite dirty. While they were initially enthusiastic and supportive – and they appreciated the involvement of senior staff in the work – their enthusiasm is waning. The senior staff have tended to be called away to consult with insurers and officers of the institution and have not always returned. Staff are beginning to complain about conditions. The Technical Services Departments are in the north wing, which is unaffected by the fire, and staff from those areas are starting to talk about getting back to their own work. Everyone wants to know how much longer they will need to be involved. Some wonder if the insurance will cover the hiring of staff to do this work. They are, after all, highly trained professionals and *anyone* can put paper towelling between the pages of a book.

What Should Have Been Done

It has been suggested that staff enthusiasm for disaster recovery will last about seventy-two hours. It is not challenging work, it is boring and it is dirty. The Disaster Controller must maximise his staff resources. He should:

- * make sure that staff are fully briefed about the disaster and that they have an idea of how long they will be involved;

- * be open to suggestions – maybe hiring casual staff *is* an option;
- * show appreciation for the work which is being done;
- * make sure that staff take regular breaks and that they do a variety of tasks;
- * arrange for meal breaks and for the provision of food and drink. The more interesting this food can be made, the better. A *variety* of takeaway will be better than a regular supply of the same food.
- * sometimes gimmicks may work – silly awards for silly achievements, e.g., a Mars Bar for the dirtiest face at the end of the day!
- * involvement of senior staff is important for morale. The involvement should be genuine – a token involvement followed by a retreat to more comfortable quarters will do more harm than good.

This may not extend staff commitment beyond the suggested seventy-two hours, but it may make work done during that time more effective. After the disaster is over senior management (or the staff themselves) might consider some kind of commemorative gesture – after the National Library fire staff wore T-shirts marking their involvement in the recovery.

Helene Donnelly speaks of a company which had established a disaster plan for their electronic media but had not considered either the paper records or the staff. After the disaster:

Heating and ventilation were extremely poor. Clients could no longer be invited to demonstrations in the office. The cleaner handed in her resignation after fourteen years of service.... Staff illness rose thirty per cent after the incident. Management lost control of the working environment. Two and one-half years after this fire, the company went under.[19]

The staff of the institution are no less valuable than the contents of the building and they must not be put in peril. This is further discussed in the following chapter.

Public Relations and the Media

If the institution has a high profile, or if the disaster has unusual aspects, then the media will be in attendance. Aspects which must be considered include the following:

- * The information provided should be accurate and authoritative. It will not help the institution if staff who do not possess the relevant information appear on television giving a false (and possibly damaging) picture of the situation.
- * The media may be a conduit to the provision of valuable assistance.
In the first chapter a fire which affected a collection of music scores was described. As a result of press coverage it was possible to restore sufficient scores for a fund-raising concert to be held, and the publicity which this project received caused that concert to be successful. People with expertise may learn of the disaster through media coverage and make themselves available to assist.
- * The media should not be allowed to interfere with the recovery operation.
The media will want to see the disaster site. This may provide the opportunity for a sympathetic and valuable portrayal, so the media representative may do as the Director General of the National Library did and provide guided access to the site.

There should be an understood media representative; this may be the officer-in-charge of the library or archive, or it may be the designated Public Relations Officer of the institution. Staff should be trained to refer media representatives to the proper source. Keeping in mind that the cooperation of the media is wanted, staff should be advised to do this in a courteous and helpful manner.

In the previous chapter a number of organisations which had experienced disasters spoke of help from state and national libraries and archives. These institutions employ trained conservators who are able to give practical advice or who will be able to refer enquirers to specialist conservators in private practice. If an outside conservator is employed, the institution should be prepared to take his advice. This is one of the cases where the Disaster Controller should accept outside direction (the other is, obviously, direction from the Emergency Services on matters affecting personal safety).

Scenario 3. Public Relations and the Media

The company has a high profile and is located on one of the main streets. A fire has started in an area adjoining the records management area. It has been extinguished but there is extensive fire and water damage to the area including the records management department. A considerable number of valuable records are stored in fire-proof cabinets, but others, including some awaiting refiling in the cabinets, have been damaged. A disaster recovery is in progress and files are being taken to a nearby building where decisions for their treatment are being made. A television news team intercepts a member of the recovery team as she is returning from the treatment area. With cameras running and microphone on they ask her what has happened and what damage has occurred. She is distressed by what has happened and disconcerted by the attention which she is getting but she feels that she should try to answer their questions courteously and helpfully. Because she is unprepared and does not have the full picture, her comments are misleading. Viewers of the news believe that the disaster was far more extensive than it was, that critical material may have been lost and that human error may have been the cause (she said, in fact, that she didn't know if it might have been caused by human error). Although the company goes into damage control, it is unable to reassure many who saw the original bulletin and the company suffers some financial loss because of it. Management realise that the staff member involved was well intentioned and did her best, but there remains a feeling that she does not operate well under pressure and memory of this may affect her future prospects.

What Should Have Been Done

The company is a high profile one and its location on a main thoroughfare makes it very likely that any disaster will attract media attention. There will be a public relations department in such a company and *all* staff should be aware that media should be referred, courteously, to the public relations representative. Apart from anything else, this is for their own protection, as, in the example given, providing faulty information will not do their promotion prospects any good. Staff should also be aware of the need for courtesy; the company will wish a sympathetic treatment

in the media and may wish to convey reassuring messages to the public. Alienating the media will not help.

Commercial Companies

In recent years there has been a growth in the number of commercial companies which will provide a disaster recovery service.

Fischer Steamatic/BMS Cat, Melbourne

BMS Cat is an international organisation and Fischer Steamatic/BMS Cat are their Australian representatives. They are located in Melbourne but will attend disasters anywhere in the country. They will undertake the cleaning and restoration of buildings, computers and records. They have a core group, which includes computer specialists, and have access to extra staff. They have a freeze-dryer which can handle about sixteen to twenty-nine archive boxes. The drying cycle takes about seven to ten days.

Moisture Control Services (Aust) Pty Ltd, Brisbane

MCS will also handle disasters anywhere in Australia. They say that most projects are undertaken in-plant in Brisbane with damaged material being transported by refrigerated road transport from anywhere in Australia. They handle document restoration by means of freeze-drying and dehumidification. They will clean and, if necessary, fumigate damaged documents. MCS state, in their brochure, that if the building is not ready to take the materials back when treatment is finished, they will arrange temporary storage.

Munters Pty Ltd, Sydney

Munters are also a worldwide company and specialise in dehumidification and the drying of disaster sites. They state that they are not a cleaning company but work in conjunction with such companies in various aspects of disaster recovery. Munters will work on site or will remove material to their own premises. They will dry paper documents, electronic equipment and records as well as buildings and furnishings.

Relectronic-Remech, Sydney

Relectronic-Remech specialise in electronic, mechanical and structural restoration. They will handle fire damage, corrosion, acid, environmental, water, toxic and production-related damage. They will either work on site or remove equipment to their Sydney offices. This company is owned by a major insurer located in Munich and was begun because it was realised that much money was being paid to replace equipment which was not seriously damaged but rather contaminated by soot, smoke or water. Relectronics state that they are '...an engineering based and staffed company which carries out professional decontamination work on high technology equipment....'[20]

Brambles Record Management, Auckland

Brambles Record Management will handle disasters anywhere in New Zealand and have staff on site twenty-four hours a day, seven days a week. They have access to the National Library's freeze-drier and can provide refrigerated transport to that site. If they find that the site has been contaminated, then they may call on a specialist conservator, John Doig, for expert assistance.[21] Brambles Record Management can also provide off-site storage for valuable records.

If the institution sees employment of a disaster recovery firm as a practical possibility (and smaller or impoverished institutions may not), then it would be a good idea to talk with such a firm when setting up the disaster recovery plan. Fischer Steamatic/BMS Cat, for example, have a registration system whereby, in the case of an area-wide disaster, registered institutions would receive priority treatment.

It is well to choose a firm with an established track record. There is a depressing report of a recovery which went wrong in the United Kingdom.[22] Kevin Green talks of a company (which, with a wary eye for possible litigation, he calls 'Disasterco') whose performance compounded the original disaster. He notes: '...of twelve pieces of electrical equipment sent away for cleaning, one of which was known to be in need of repair, six were returned either damaged or in need of specialist repair.'[23] It took three months to get back to normal. A similar warning is sounded by Georgine Thorburn, who talks of an industrial cleaning company who assured a librarian that they could clean books too.[24] Fortunately he insisted that it be done on site and, after a couple of days, was so horrified at the results that he discharged them and

brought in another firm. It was found that the books which the industrial cleaner had handled were beyond salvage.

Cooperative Action

It may well be worthwhile to discuss disaster recovery with nearby institutions. A combined disaster store may be a wise financial move, especially if the institutions concerned have limited funds. A system such as that operated by Artlab (whereby institutions on North Terrace in Adelaide maintain a common store of disaster supplies – see Chapter 3) makes a lot of sense for institutions in close proximity. If staffing is limited, it may be worthwhile to establish reciprocal agreements so that expertise and manpower may be shared. Association may lead to the exchange of information and the development of joint training sessions, as has been done by the member institutions of CAVAL Ltd.

Techniques Used in Recovering Water Damaged Items

It is as well that managers are aware of the various techniques which disaster recovery employs. These techniques can be both time consuming and expensive, so managers should be able to assess the commitments which their Disaster Controllers may need to make.

Most disasters are likely to involve water damage; earthquakes may fracture water mains, fires will be extinguished by water or heavy rain may penetrate the building fabric. Most disaster recovery, then, concentrates on the treatment of water damaged items.

The Danger of Mould and Its Treatment

Wet and humid conditions encourage the growth of mould. What is mould, and why does it matter? Sandra Nyborg has said:

Basically, mold and mildew eat library materials. Books and paper provide a source of nutrition through such components as cellulose, starch adhesives, and starches in sizing. The mold and mildew excrete digestive enzymes that allow them to eat starches and cellulose, grow, and produce more spores. Cellulose in paper is difficult to digest, so many molds prefer the starch in cloth-coverings on books and in paper sizings. In book collections, mold

is often noted on the bindings long before it grows on textblocks. Molds grow rapidly, although they generally grow at a slower rate when relying on only cellulose for food.

Conditions that promote mold and mildew growth (high humidity and warm temperatures) will also, in and of themselves, increase the rate of book/paper deterioration by accelerating the aging process and the formation of acids. Furthermore, mold and mildew can irreversibly stain books and paper. Such stains destroy text and images. Books and paper can also be seriously softened and weakened by mold, making them difficult to handle.

Mold and mildew can have an adverse effect on people. Those with allergies, asthma or other respiratory problems should stay away from infested areas, as many fungi will seriously irritate and inflame lungs. Some fungi can cause skin and eye irritation and infections. Prolonged exposure to germinating molds in closed areas (which exist in many library collections) can damage the lungs, mucous membrane, cornea, respiratory tract, stomach, intestines, and skin.[25]

Mould is dangerous for the materials in the collection and for staff working with them. How is it treated? Sandra Nyborg says:

Before describing processes that will kill mold, I want to stress the fact that the ONLY way to get rid of mold permanently and to keep mold from your collections is to control the environment within non-hazardous ranges of temperature and humidity. You may use chemicals to kill mold, but the only safe and effective way to keep it from coming back is to modify the environment which contributed to the development of mold.

... If a small quantity of books is moldy, seal them in air-tight plastic bags. If the infestation is large, quarantine the area. You should wear rubber or plastic gloves and a dust or filtration mask whenever handling moldy materials. Isolating moldy books and papers serves two purposes: it minimizes the spread of mold, and it protects those persons who may have allergies or respiratory problems from harm.[26]

For further information reference should be made to Nyborg's article, which can also be found on the Internet.[27] It contains detailed advice on the treatment of mould including freezing, gamma radiation, ultraviolet light and chemical treatments. As mould will appear approximately forty-eight hours after water damage occurs, the sooner action can be begin, the better the result will be.

Scenario 4. The Danger of Mould

The university used to teach in the humanities but has discontinued these courses to concentrate on science and engineering. The university library still holds materials in literature and history, but they are little used. Weeding and discarding this material theoretically has high priority but has taken second place to other projects. One day a student comes to the Information Desk with a book which is deformed and has mould along its top and fore edges. On investigation staff find that all books shelved in that bay are similarly affected. Water marks are seen on the wall above, and it is discovered that, a couple of weeks before, there was a leak in a staff room in a department on the floor above. The leak had been repaired and no one was aware that water had percolated through to the floor below. One of the library cleaners had seen a small amount of water on the floor on a Monday, had mopped it up, checked back a couple of times and, as the water had not reappeared, had assumed that the problem had been dealt with.

What Should Have Been Done

Leaks in other departments are outside the control of the staff. What the library can do is seek to monitor its own environment. Any water spills which are not readily identifiable and curable should be reported to library management. Staff should be monitoring the bookstacks, even if it is known that some areas are little used.

Techniques in Recovering Water Damaged Items

Over the years various methods have been used to restore materials suffering water damage. These vary from simple, but usually labour intensive, methods through to sophisticated and often expensive techniques.

Air-Drying

Air-drying is low tech but labour intensive. Air-drying also needs a great deal of space. To be air-dried, books need to be placed upright, with the

covers opened slightly and a flow of cool air directed upon them. Drying is aided if paper towelling or blank newsprint is placed between pages at designated intervals.[28] If the book has been printed on coated paper, or if there are illustrations on coated paper, then paper towelling must be inserted between *each* such page. If this is not done, the pages will block, and once they become blocked the damage cannot be reversed. For this reason the sooner action can begin with books printed on coated paper, the better. If such a book has not blocked and is frozen quickly, it may be successfully freeze-dried (see below).

Where document files are involved, they may be laid out flat upon the floor and the pages turned on a regular basis as they dry. It is important that the integrity of the files should not be jeopardised in the drying process, so care must be taken to ensure that the order of documents in the files is maintained. In this case, therefore, the flow of air should not be directed *on* the files but may be directed upwards so that a consistent flow of air through the room is ensured.

Problems: Books may be distorted, coated paper may block, inks may run.

Wind Tunnels

It is possible to expedite the drying of books by the use of wind tunnels. Wind tunnels are usually thought of as large structures through which air is directed at high speed to test the aerodynamic properties of a vehicle. In the context of air-drying, however, the wind tunnel is a (usually) small improvised structure through which a gentle flow of air is directed so that books placed in the tunnel may dry more quickly. Because such structures are not usually part of the equipment of an institution, they are usually constructed from available supplies, e.g., large sheets of cardboard, sheets of plastic supported by chairs, etc. The books are stood upright (or on cradles parallel to the flow of air), the tunnel erected over them and a flow of air directed through the tunnel. The tunnels can take up a considerable amount of space and so this may not be appropriate if a large number of books is to be treated. They can, however, be used for books whose recovery has priority.

Dehumidification

In this system treatment can be done on site by use of large desiccant dehumidifiers. In addition to records and books, floor coverings and furniture are dried. The building structure can be dried by the pumping of dry air into walls. Dehumidification companies may also remove materials for treatment off site.

Problems: Coated paper will block.

Vacuum Thermal Drying

Items are placed in a vacuum thermal drying chamber. The vacuum is introduced, the chamber heated and the items dried above freezing point. In this method the items remain wet as they dry.

Problems: Books can distort as they dry, mould can occur, inks may run, and coated paper will block.

Freezing

Freezing an item will fix it in its condition at the time of freezing. Basically, freezing an item will buy time while treatment decisions are made. If there is a significant amount of material to be handled, it may be appropriate to freeze that material which cannot be handled within forty-eight hours. It can then be defrosted at a later time and either air- or freeze-dried. Freezing should be kept in mind if books on coated paper have been affected by water. If frozen *before* they block, they may well be saved at a later date. In a self-defrosting blast freezer books will dry over time, but, as this may take a matter of months, it should not be used unadvisedly.

Freeze-Drying

Freeze-drying exploits the behaviour of water at low temperatures and pressures. Frozen water will pass from solid form to vapour by sublimation rather than by melting. A book subjected to freeze-drying will retain its shape throughout the procedure, and water soluble components will not migrate in the course of drying.

Freeze-drying has been widely used in recent years. It was a known laboratory technique at the turn of the century and was used for the preservation of blood plasma during the Second World War. There were early experiments in freeze-drying books in the 1950s and 1960s, but the first recorded account of its successful use in salvaging water-damaged paper is covered in a letter from James Flink and Henrik Hoyer to *Nature* in 1971. They wrote:

While a fire was being extinguished at the Greenland Regional Library in Godthåb during the winter of 1968, many valuable items (hand-written manuscripts, books, letters and so on) became wet and subsequently froze. The damaged items were transported in their frozen state to Copenhagen and held there for two years while decision was made about the drying method to be adopted.[29]

Because it was felt that the ink would run during melting, the Food Technology Laboratory at the Technical University of Denmark was asked to try freeze-drying. After experiments with modern papers and inks had shown the process to be practicable, the laboratory proceeded to handle the frozen items. The papers were contained in twenty-seven storage packets, and staff were able to separate the papers into separate stacks 2 to 3 cm thick.

The stacks were placed on pre-cooled, porous sample trays, and conservative freeze-drying conditions were chosen so that no melting or colour change could occur. Radiant heating at a plate temperature of 45°C and a chamber pressure of 200mtorr was used. The sample weight was monitored using the balance built into the freeze-dryer, and drying was continued to a constant weight. The average drying time in these conditions was about 1.5 to 2 days, and when the drying was complete, the chamber vacuum was slowly released.[30]

Flink and Hoyer found that the results were excellent, pages separated easily and the ink had not run. The only adverse affect was that some wax seals had softened. Where packets had been distorted prior to freeze-drying, they had retained this distortion and required further treatment.

Freeze-drying was then used in various disaster recoveries, including, as has been mentioned, the Stanford Meyer Library project. In Australia, Kim Morris, Senior Conservator at the Australian National Library), reports that, following the fire in 1985 the National Library of Australia made the decision to purchase a vacuum freeze-dryer.[31] The Library was influenced by the extremely limited availability of large vacuum freeze-dryers in Australia. Those that existed were operated by food processing and pharmaceutical companies. Local expertise in freeze-drying water damaged paper was virtually non-existent. The freeze-drier which the National Library acquired had a 1m x 2m chamber with four flat temperature-controlled shelves. Morris notes that this was regarded as large by Australian standards at the time, but later experience has shown it to be too small to be an effective option when dealing with large amounts of wet material due to the time factor. Early testing showed that the unit was capable of drying a load of 200 books in two weeks with the addition of the heated shelves in the second week. In 1989 Eric Archer, conservator in private practice, approached the National Library with a proposal to lease the unit and work space to vacuum freeze-dry and treat fifteen pallets of water damaged material. After negotiation with the insurance company concerned a price was agreed and the project began. It took thirteen months to complete with an average of twenty-nine days per load.[32] Since then the National Library has carried out two major freeze-drying projects. Morris also notes that many small cultural

institutions do not have the insurance backing which would enable them to take advantage of freeze-drying, whether from the National Library or one of the commercial disaster recovery companies which now provide a similar service.

Problems: not particularly suitable for leather or vellum.

Publicising the Plan

If a library or repository has a disaster plan but its existence is not widely known, then this lack of knowledge may cause further damage. Cases have been reported in the literature where disasters have been discovered by staff who were not aware of the existence of a library disaster plan and where the members of the recovery team were not advised until damage had occurred. There has been another case where there was a plan, the recovery team was notified, but, before they arrived:

...over forty staff members and volunteers, with abundant adrenalin, began an immediate, noble but haphazard rescue operation, while unknowingly risking electrocution....many damp, wet and dry books were intermixed and stacked together.[33]

There has also been the possibility, suggested to the author, that, in the adrenalin rush of disaster, higher echelons of an institution may disregard what they see as the pretensions of the library or archive and counterman or disregard the requirements of the plan.[34]

Ideally, of course, the disaster plan of a library should form part of the disaster plan of the parent institution. If the plan has been originated by the library or the records section, it must be sold to the senior management of the institution. While the plan is being developed, discussions should be held with the staff responsible for security, for occupational health and safety, for control of the buildings and properties of the institution. If it is a large institution, this may be more easily proposed than accomplished, but it must be done. If a library has a perfectly adequate plan to air-dry materials, it will be a waste of money for higher management to decree that freeze-drying must take place or that the restoration be automatically passed to a commercial firm. This may be appropriate, but if the library has prepared the plan, then it is expert in the field and should be involved in the decisions.

Security staff should understand that if, say, water damage is discovered after hours, designated library staff must be advised immediately, no matter how late the hour. It would be useful to explore

the possibility of linking a 'disaster' to an institution's safety evacuation drill. Even if it is decided that this is not appropriate, the discussion will, at least, have raised the profile of the disaster plan.

Scenario 5. Security Services and the Plan

Classes have finished, the library closed at 6.00 p.m and will re-open on Tuesday morning. Most people have left. A security guard is checking buildings. Going past a store-room used by the library, he sees a trickle of water coming out under the door. He opens the door and finds that a joint on a water pipe is leaking. The leak is falling between the book ranges and pooling on the floor. He is aware of the location of a cut-off valve and turns the water off. He knows that no one from the library is still on the premises and, believing that he has contained the leak and that the water on the floor will evaporate without damage, he locks the door, records the occurrence and leaves a message on the library's answerphone. On Tuesday morning library staff receive the message and go to check. They find that the water on the floor has largely dried but that the guard was not aware that a substantial part of the leak had run back along the pipe and fallen on a top shelf unprotected by a canopy. Science journals on that top shelf have suffered severely and the coated paper has blocked irretrievably. Humidity has also caused the growth of mould on the two ranges between which the original leak was located.

How Could This Have Been Avoided?

Library staff should have been aware of the existence of the water pipe and should certainly have ensured that any shelves crossed by it had waterproof canopies.

The Security Staff should have been advised by the library that any mishap concerning the library should be reported immediately to designated library staff no matter what the time or the day. Contact telephone numbers should have been provided.

Restoration of the Site

Once the materials have been removed for treatment the disaster site must be returned to a workable condition. Materials must not be brought back until the humidity is at a safe level (47° Relative Humidity $\pm 2^\circ$). It may be that the institution has a maintenance department which can handle this, or it may be that a commercial company must be brought in (especially if the carpet has been saturated). Again, as was said earlier of commercial recovery companies, it is as well to choose a cleaning company with a proven track record.

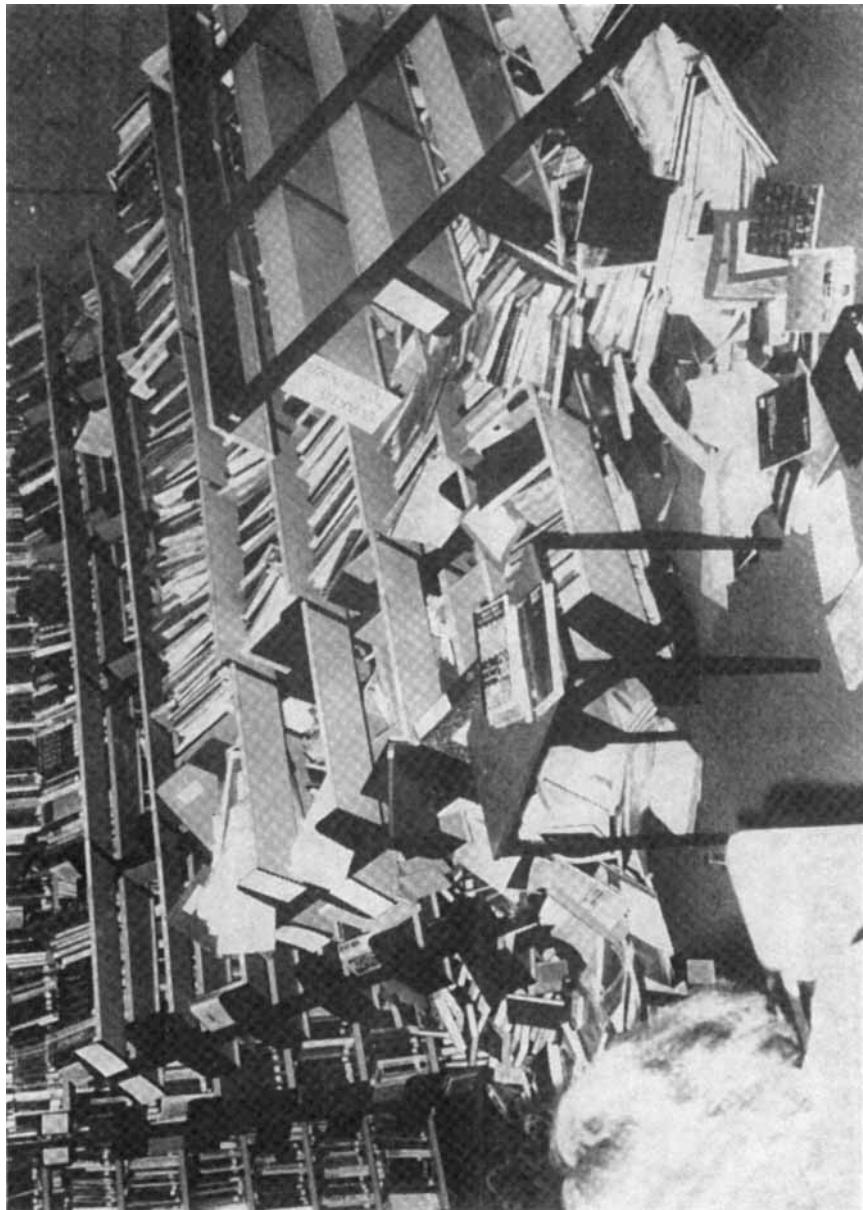
Once management has considered the implications of a disaster recovery plan, the Disaster Controller and his team should go ahead to compile the detailed disaster plan. Ideally this planning team (who need not necessarily be the future disaster recovery team) should contain staff with a knowledge of the building, of financial matters and of the content of the collection. It is also helpful if the staff at large know that the project is undertaken with the support of management. This sounds very obvious, but there have been cases where this has not been clearly stated and the plan developers have had difficulty in persuading their colleagues that the information which they require is necessary. Staff have many other pressures and may feel that the disaster plan comes after what they see as more pressing matters. There will be the need for a public awareness campaign both while the plan is being compiled and after it is finished. This publicity will be needed not only within the library, archive or records management section but also in the wider institution. It will not help if the administration of the wider institution is not aware of the plan and its contents.

Notes

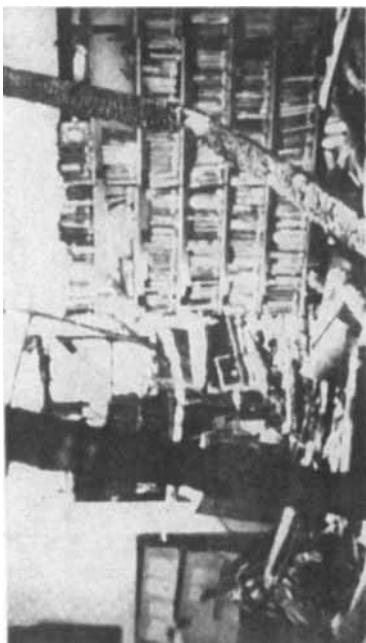
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- 11 A.O. (Tony) Clarke, 'Polythene Drapes for the Protection of Shelved Books.' *New Zealand Libraries* 45, 9 (March 1988): 202-3.
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- 14 *Ibid.*, p. 21.
- 15 The author wrote something to this effect some years ago and then raised her eyes to see her backup disks sitting in their usual place, next to the computer.
- 16 Standards Australia. '*Records Management. Pt 6: Storage.*' AS 4390.6-1996 (Homebush: Standards Australia, 1996).
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<http://155.187.10.12/disaster/human-responmse.html>
- 18 Kathleen Coleridge, 'Flood at Victoria.' *New Zealand Libraries* 44, 10 (June 1985): 193.
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- 21 Not related to the author.
- 22 Kevin Green, 'The Case of the Pilkington Technology Centre Fire.' *Aslib Information* 21, 2 (February 1993): 72-5.
- 23 *Ibid.*, p. 74.

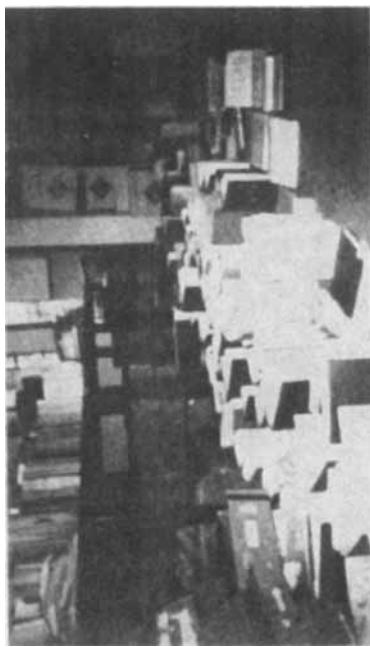
- 24 Georgine Thorburn, 'Library Fire and Flood – Successful Salvage, but Beware the Cowboys.' *Aslib Information* 21, 2 (February 1993): 77.
- 25 Sandra Nyborg, *The Invasion of the Giant Spore*. SOLINET Preservation Program, Leaflet Number 5 (1 November 1987).
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- 27 Sandra Nyborg, *The Invasion of the Giant Spore* [Web document]. Available URL:
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- 28 Paper towelling has the advantage of being in sheets which are approximately the size of an average book page. Blank newsprint (which may be cheaper) will need to be cut to the appropriate size and so there will be the additional cost of preparation.
- 29 James Flink and Henrik Hoyer, 'Conservation of Water-damaged Written Documents by Freeze-drying.' *Nature* 234 (November 1971): 420.
- 30 *Ibid.*
- 31 Kim Morris, 'A Vacuum Freeze Dryer: It's Nice to Have One but.... A Short Paper on the National Library's Vacuum Freeze Dryer Nine Years On,' in *Redefining Disasters: A Decade of Counter-disaster Planning* (Sydney, October 1995).
- 32 The time taken was affected by the thickness of the frozen loads. Eric Archer reports that it was necessary to saw apart (at the junction of the covers) some loads which were too large to fit in the vacuum chamber. Although the clients' promptness in freezing the water-damaged material was commendable, they would have been better served if they had frozen the items in smaller loads.
- 33 Karen Underhill and Randall Butler, 'Twas the Day after Christmas...: The Northern Arizona Cline Library Flood.' *CAN* 46 (Summer 1984): 12.
- 34 What my colleague actually said was, 'Judy, what makes you think that they will *let* you run the recovery? You *know* that (deleted) will move in and take over!'



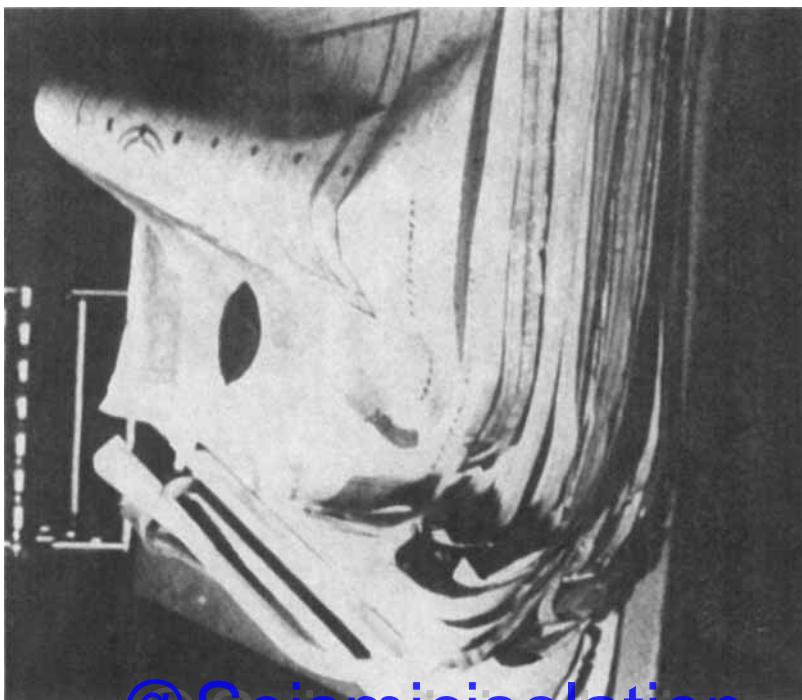
*Aftermath of shelving collapse at Monash University, Gippsland Campus.
Photograph: Monash University, Gippsland Campus*



*The fire at Wesley College.
Photograph: Victor da Costa*

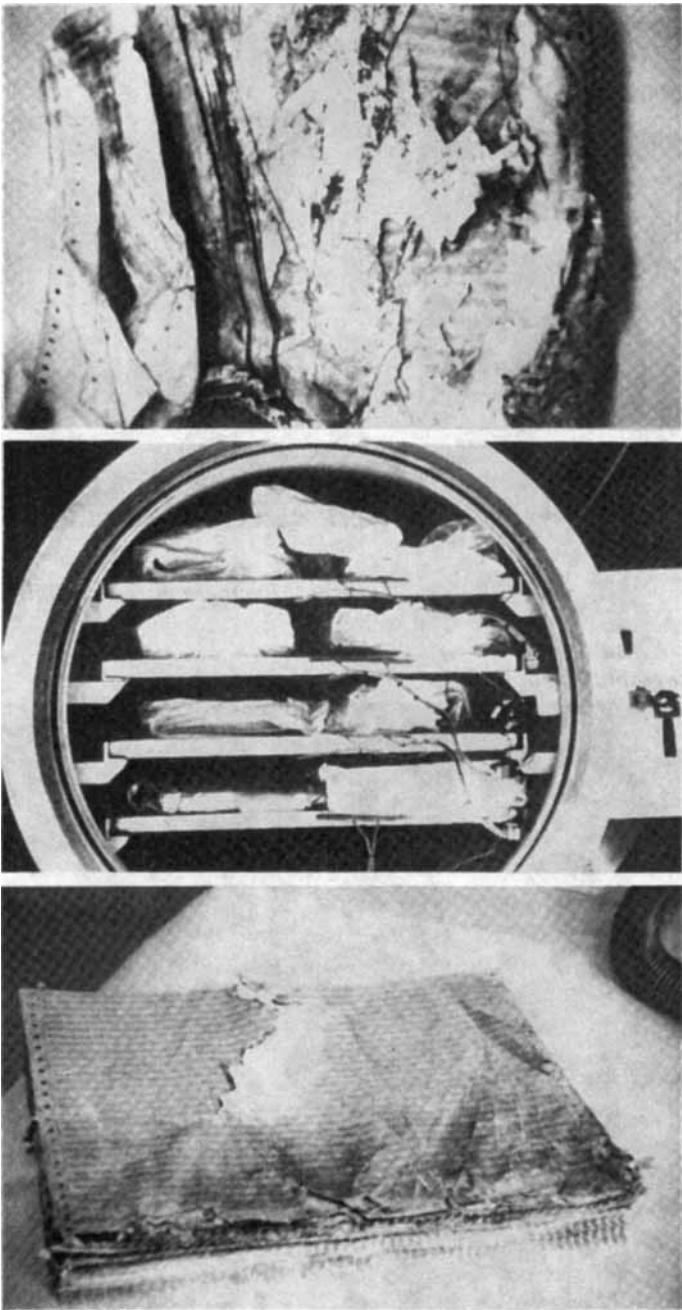


*Materials drying after the flood at the National Herbarium.
Photograph: Victor da Costa*



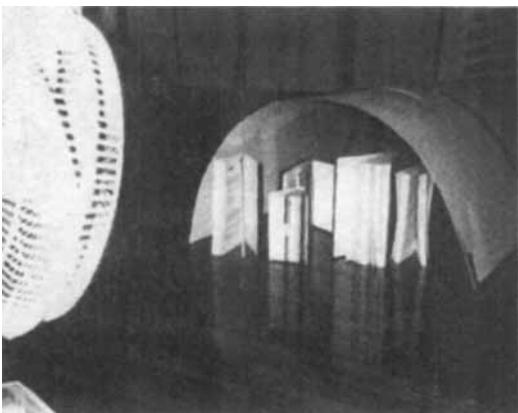
*Soot damage in the Melbourne City Council Archives.
(Note where the weights had rested prior to the fire.)
Photograph: Alison Kelly*

@Seismicisolation



*Freeze-drying at the National Library:
the freeze-dryer and a printout before and after freeze-drying
Photograph: Victor da Costa*

@Seismicisolation



A disaster bin
Photograph: Judith Doig



Sorting items at 'Lessons from Leningrad'.
Photograph: CAVAL Ltd

@Seismicisolation

3 Preparing a Disaster Recovery Plan

This chapter is divided into two parts: first, the procedures which a Disaster Controller will follow in addressing a disaster; and, second, the source information which the controller will need to implement the plan.[1] When putting the plan together, the source information will be compiled first, but for the sake of clarity we will address the recovery procedures first and make reference to source information as it becomes appropriate.

Do not overload the plan; it is an operational document. The overriding aim is to make it as clear and unencumbered as possible. It is imperative that the plan be:

- * concise
- * clear
- * simple
- * step by step

and, obviously, it must be written and it must be accepted by authority.

Staff carrying out the duties which the plan specifies will be operating under pressure, and may be under some tension or in distress; this will be especially so if the disaster is widespread and they also have concern about their homes and families. Murphy's Law may also ensure that some trained members of the response team (including even the Disaster Controller) are not available at the critical time and so untrained but willing staff may be learning as they go. A plan which is prolix or obscure will only add to their pressures.

Once the plan has been compiled, it must be discussed with and accepted by the senior staff of the institution. It will not help if, in the event of a disaster, staff from outside the library or department feel that they are required to undertake responsibility for the recovery. This has been discussed in greater detail in the previous chapter.

Part 1: Writing the Plan

Some have commented that the variety of disasters which may occur renders a disaster plan impractical. An examination of published disaster plans will show, however, that their basic structure is very similar. There is a basic, generic plan which can be adapted to various circumstances. In this chapter the considerations that must be taken into account when constructing a disaster plan are discussed.

Aims, Definitions and Responsibilities

It is as well to be clear about the purpose of the plan.

Aims. The aim will vary from institution to institution. It may be to rescue and salvage certain vital items efficiently; it may be to restore service as soon as possible; or it may be both. It is as well to state the aim clearly. Members of the recovery team should accept a shared view of the purpose of the recovery. If the aim of an institution is to restore service as soon as possible, then this will require a different emphasis in the recovery operation than if the aim is to ensure that priority is given to a certain number of individual items or collections. There may be outside pressures to vary the priorities; for instance, an academic (possibly a very senior member of the university) may demand that material in his area of research be recovered ahead of the established priorities. It will help in this case if the Disaster Controller can show the aim of the plan, the policy statement (which is why it is a good idea to have one) and the established priority listing.

Definitions. There may be terms which need definition. For instance, the plan may talk in terms of a 'major' disaster and a 'minor' disaster, and it will be necessary to establish the criteria for this distinction. If these terms are used, they will refer to the physical scope of the disaster and the size of the salvage and recovery effort. A 'minor' disaster might be limited to an office or, in a library, to a specified number of shelves of material. Admittedly, a disaster affecting a single office may have damaged the institution's prize possession, but the salvage operation is limited to retrieving that single item, as opposed to a 'major' disaster which may call for the organisation of large teams of people.

Another possibility for definition might occur if there were a variance in the naming of locations and a commonly accepted name varied from

the official name. If so, the version selected should be established at this point.[2]

Responsibilities. Who is in charge, and what is the chain of command? There should be no ambiguity; if the head of a department or, indeed, the organisation itself is *not* the designated Disaster Controller, then he should not attempt to assume these duties. There are other roles, such as public liaison, more appropriately done by such senior staff. Having set up the disaster plan and identified a Disaster Controller (together with his recovery team), then the institution should be happy to leave the control in his hands. It may also be necessary for the Disaster Controller to establish with Emergency Services or senior staff of the institution that he is *entitled* to be present. The Disaster Controller, therefore, should carry identification. The Disaster Controller should, however, accept that he may be overruled by Emergency Services officers in questions of public safety and that he should also be prepared to accept the advice of any trained conservators involved in the recovery.

Scenario 6. Responsibilities - 'Owning the Plan'

The previous evening a tea urn was left on in the office next to the Arts Faculty Library. At some stage during the evening it boiled dry and a fire started which spread to the Library. Although the Arts Faculty Library reports to the Faculty rather than to the University Library, the Faculty Secretary has discussed disaster recovery with the University Library and has established priority retrieval items in discussion with the Faculty's Administrative Officer. This has not been easy as faculty members have regarded the likelihood of fire or flood as remote and of lower priority to their other responsibilities. They have also been unreceptive to input from the University Library as they fear that their collection may be absorbed by that body. Following the fire and the resulting water damage, action by the Faculty Secretary, the Administrative Officer and the tactful assistance of the Deputy University Librarian is attempted. The response of faculty members falls into three groups:

- 1 This material is required in *my* course (or is owned by me and on loan to the Faculty Library) and *must* be recovered and attended to with all speed.
- 2 Throw it all out and replace, we don't have time for all this.

3 How should we treat the damaged material?

Regrettably, the first group is by far the largest and contains some very senior (and very formidable) faculty members. One or two have heard of freeze-drying and demand that their material be freeze-dried – some of it is vellum bound, much is on coated paper and has blocked.

What Should Have Been Done?

This is tricky. The basic problem is that the Faculty's disaster recovery plan has not been accepted by the senior members of the Faculty. To be effective, it needs to have been accepted by the Dean and the Heads of Departments as their authority will be required to ensure that the formidable faculty members abide by the decisions already made. The person acting as Disaster Controller needs to be someone with clout. Standing in a disaster aftermath is no time to be establishing priorities. This is not to suggest that it will have been easy – if a disaster has never happened, people will feel that it never *will* happen. The Secretary and the Administrative Officer are to be applauded for their efforts but they are doomed to failure without support from senior staff. The silver lining would probably be that staff in the other faculties will have an easier time of it.

Steps in Recovering from a Disaster

No one should enter the site until it has been declared safe. This may have been done by the Fire Brigade or by the Buildings Manager in consultation with an electrician. Remember, water and electricity is a lethal mix. If there is water on the floor, be very sure that all power has been turned off. If the water has come from a fractured or leaking pipe, then see that the water is turned off. Even if there is no danger of electrocution, there may still be danger in the site; if there has been any structural collapse, there may be unstable partitions or shelves; if there is water on the floor, it may be obscuring potentially dangerous objects such as protruding nails;[3] there may be objects which will trip people, or the floor may just be slippery. Lighting is essential: if there is no natural lighting and the normal lighting is not operational, it may be possible to have lights run in; it may be necessary to use flashlights; or, as in the case of the Artlab Central Store (see below), hardhats with flashlights attached may be provided.

That the site has been declared safe is no guarantee that it will remain so. There have been cases where hot spots have flared up again (this happened with the Sydney fire where music scores were damaged) or for other reasons the site may have become unsafe. In such an occurrence the Disaster Controller may be asked to clear the site.

Safety remains the overriding consideration. There is a danger in disaster recovery that people will let their desire to respond outweigh their rational and thoughtful consideration. It has been said that one of the most useful things which a Disaster Controller can do is to go away alone for half an hour to think through the process and ensure that nothing has been overlooked. The Disaster Controller should not feel pressured into making hasty (and possibly wrong) decisions. Although we emphasise that speed is important, thirty minutes will not make all that much difference and it may ensure that a wrong path is not followed.

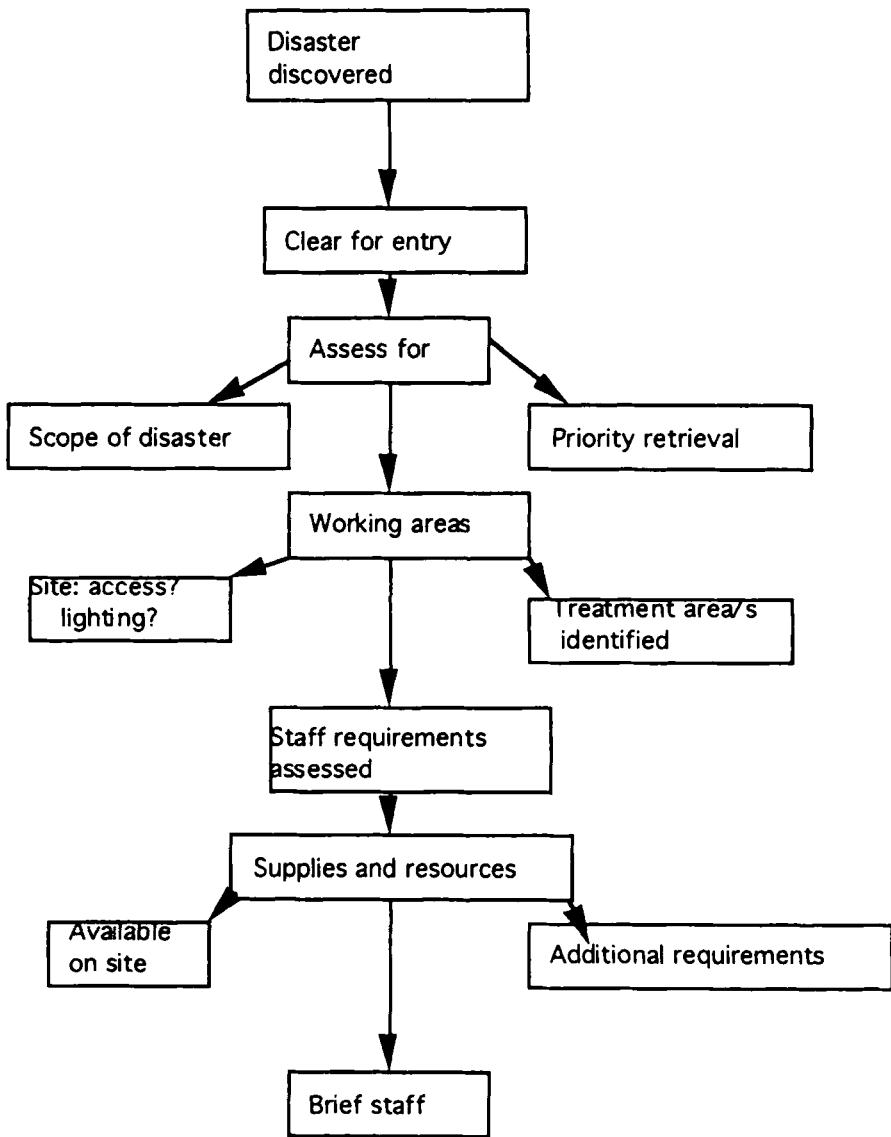
There is a useful flowchart which emphasises the number of actions which should be taken before *anything* is moved.[4]

All these steps should be taken *before* a single item is salvaged. The information contained in the appendixes to the plan provides the critical background for these actions (see Part 2 below).

Initial Action

Once it is possible to enter the site with safety, the situation should be checked. There may still be water dripping onto the collection; if this is so, the shelves should be covered with plastic sheeting and, if possible, the runoff directed into buckets. Be careful not to leave materials under these plastic sheets for too long; the resulting mini-climate will encourage the growth of mould.

The *scope* of the disaster needs to be ascertained and the damaged areas checked against the priority listing for that area (see Part 2, Section 1 below) It may be at this point that a decision is made to call for the services of a commercial disaster recovery company (see Chapter 2). The disaster bin (see Part 2 (Supplies) below) will contain a disposable camera and this should now be used to record the damage. This will support any insurance claim. Video may be used if available and may be used not just



Scenario 7. Safety the Overriding Consideration

The fire is out and the Fire Brigade has departed. There is water on the floor, but power has been turned off so there is no danger of electrocution. Staff have gone in armed with torches to assess the damage. There is a fair amount of water still on the floor and staff are concentrating on avoiding hidden snags. Because the torches are directed at the floor, a staff member fails to see that a range hood has come loose and is projecting into the aisle. He suffers a gash to his head and there may be some eye damage.

What Should Have Been Done

Before the damage is assessed the safety of the site should have been secured. A limited number of staff should have entered and should have been wearing safety helmets and protective clothing. At this point their aim is to identify *hazards* rather than damage to stock, so their torches should be directed, not just at the floor, but also at shelving, at the ceiling, at anything which might impose danger. Hazards will include: danger from electrical shock, noxious fumes, dangerous objects obscured by pooled water, loose ceiling tiles and insecure shelving or furniture. While the emergency services will not allow entrance while obvious hazards remain, staff should still be alert to all possibilities. The recovery team must not be allowed to enter the site until all hazards have been identified, corrected or, if this is not immediately possible, clearly flagged.

to record damage for future evidence but also to inform members of staff of the extent of the damage (as was done at the Knox City fire). It will be useful for later review if the continuing work of recovery can be recorded as well, but the primary purpose of the camera is to record the extent of the disaster.

The *insurance* agent should be notified at this point. If permission to commence action is not held, such permission should be sought as a matter of urgency. It is best, however, if this has been previously negotiated. In any case, the disaster site should be extensively photographed to support any future insurance claim.

The site *environment* should be stabilised; this involves lowering the temperature and increasing the air flow. It may be possible to open windows; if not, doors should be opened, and, in any case, large fans will be needed. If the air-conditioning is still operational, it should be set to the lowest temperature. As much water should be removed (using wet/dry vacuum cleaners, mops, squeegees, etc.) as is necessary to enable salvage to begin. Once material has been removed, then restoration of the site can be undertaken by cleaning and maintenance staff or by industrial cleaners.

Operational and treatment *areas* must be decided. The control centre should be in reasonable proximity to the disaster site, and a telephone must be available.

Communication is essential. If a mobile phone or two-way radio is used, the Disaster Controller can move around the disaster recovery operation; if not, the controller should remain within earshot of the telephone – many people may wish to consult him. Remember that buildings may have 'dead spots' in which mobile telephones will not operate.

A *treatment* area should be decided. If this is in reasonable proximity to the disaster, transport will be minimised, but it may be necessary to move some distance to locate a suitable site. The treatment area or areas should be large enough to encompass the setting up of an air-drying process – there should be room to stand, spread or suspend items to dry. There should, ideally, be passage of air, and there should be security – material may have been lost in the disaster and it is just as well if there is not the opportunity for further items to disappear from the treatment area.

At this point the Disaster Controller should have a very good idea of the scale of the recovery and of the supplies which will be needed. The *operations* to be covered in disaster recovery are:

- * salvage
- * evaluation, recording and packing
- * transport
- * treatment.

The Disaster Controller will also be responsible for staff management, security and documentation.

The controller should now consult the list of trained staff (see Part 2 (Skills...) below) and, depending on the size and complexity of the disaster, call in sufficient staff to handle the disaster recovery. A good size for a team is about five members; more may get in each other's way. It may be that the trained staff are sufficient in number to handle the disaster, or it may be necessary for them to head teams of untrained staff

culled from the wider organisation. Paid workers may be hired, or volunteers may be available.

The Disaster Controller should brief the workers. He should:

- * introduce the team leaders;
- * explain exactly what is done in each segment and cover:
 - the length of each shift
 - the location of toilets
 - the location of the refreshment area and the times at which refreshments are available
 - the emergency assembly point
 - the communication system in use, e.g., two-way radio, mobile phone, messengers, etc.
 - the emergency signals in use, e.g.,
 - two blasts on a whistle = finish what you are doing and move to the next area
 - three blasts on a whistle = leave the building immediately and regroup at the assembly point and, finally,
 - where the Disaster Controller will be located.

If there is a question of staff working overtime or of outside volunteer help being used, then timesheets should be employed so that there is an accurate record of hours worked. In the event of injury being suffered by any of these people the time sheet will be required to support any compensation claim. At the end of the briefing workers should be presented with their operational instructions and despatched to their appropriate areas.[5] One or more staff members should collect the disaster bin(s) and the other supplies listed in the supplies appendix (see Part 2 (Supplies) below).

At this point the Disaster Controller should look to control the extent of outside interference. There may be intruders seizing the opportunity to 'souvenir' items, so the site should be secure. It may also be that the organisation is of a size and reputation to warrant attention by the media, and communication with the media should be restricted to a designated executive officer or his nominee. In the National Library fire it was the Director General who spoke with the media. It is better that staff who usually speak for the organisation do so; ill advised comments, even if well intentioned, can cause problems. A member of staff faced with television cameras and reporters may provide a news item which is inaccurate or even damaging to the organisation. All staff should be advised to refer enquiries to the appropriate person. Staff of the organisation who are not involved in the recovery should be advised that

Time Sheet

Name.....

Period from / / to / /

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Start							
Finish							
Total hours							
Meal Break							
Total hours worked							

Checked and approved: (Disaster Controller).

..... (Name of institution)

they will be called upon if needed and until such time every effort will be made to ensure that they are informed of the extent of the damage and the progress of recovery. Sightseers will only get in everybody's way. An appropriate person or persons should be detailed to organise a supply of refreshments for the recovery team.

At this point all the preparatory work has been done and the first items can be removed from the disaster site.

Salvage

Once the disaster site (or sites) has been established and the priority items located there identified, the salvage team can enter the site. Although they can expect that obviously dangerous objects will have been removed or clearly marked, they will still need to exercise caution. They should be wearing safety helmets and protective clothing. Access to the priority items may be blocked by books and other objects which have fallen to the floor. If so, this material must be removed first. Removal of the priority items can then begin, with items from the top shelves (or top drawers of filing cabinets) being removed first. If this is not done, fixtures may become unstable. Material should be handled as little as possible: if a book is closed, it should not be opened; if open, it should not be closed. If papers are stuck together, they should be moved carefully as the bundle which they form at the time. The items should be passed via a human chain to a spot where they may be placed on trolleys and taken to the evaluation process. If the material to be removed is in a classified order of some kind and is relatively undisturbed, its later identification will be reasonably straightforward. If, however, material is not so identified and has fallen to the floor, consideration might be given to a technique used by architectural conservator, Maureen Lovering. When salvaging items after a major fire at Uppark, Sussex, she found items scattered and broken across the floor of a number of rooms. She used the archeological technique of dividing the rooms into grids and recording where on the grid the items had been located. By later referring to an inventory of the household she was able to identify most items. While more suited to the salvage of furniture and household items, this is a technique which could possibly be of use.

The order of the next few steps depends upon the scope of the disaster and the proximity of a suitable treatment area. If the treatment area is nearby and trolleys are available, materials can be transported directly to the treatment area. If the treatment area is at some distance from the disaster site, it will be necessary to pack the materials for transport to that area (see below).

Scenario 8. Hasty and Uninformed Action

The branch library shares a building with the Senior Citizens Club. It is a two-storey building and the library is on the first floor. There is a rainstorm on a Sunday afternoon when the library is closed but the club is in use. After the rainstorm it is noticed that water is coming through the light fixtures in the club. Members present move furniture out of the way and contact an emergency number at the municipal works department. The library is entered before the municipal librarian has been contacted and is able to reach the scene. It is found that there has been extensive water damage, and people present, wishing to be of help, begin to move material down to the dry areas on the ground floor. When the librarian and her team arrive, they find that material has been moved from a number of areas in the library and has been piled in the lecture room of the Senior Citizens Club. Because a number of people have acted, there has not been any consistency in what has been moved, or any order in what has been placed in the lecture room. Some material is never located again, but it is not known if this is due to larceny or accident. The librarian and her team thank everyone for their help and then try to sort out the situation. They have a disaster plan and they have a small list of priority material, but most of this priority material is now among the piles in the lecture room. The major loss is a box of typed and duplicated material which is part of a newsletter of local historical interest. Because other items were put on top of it, the box has broken and the newsletters have suffered significant damage.

How Could This Have Been Avoided?

The library has a disaster plan and its existence should have been known to the works department. Publicising the plan should have included the advice that no material should be moved before the librarian and her staff arrive. As the building is shared by the Senior Citizens Club, there should be advice there that the librarian must be contacted for any questions concerning the library. A notice by the entrance to the library could have been of use.

If the newsletter was of value, it should have been more securely stored and, perhaps, should not have been at the branch library at all.

Evaluation

The Evaluation Manager should be the person with a knowledge of the content and value of the collection or records. His role is to inspect the material as it comes from the disaster site and to decide the treatment which is appropriate. Categories may be:

- 1 for air-drying: the item is damp to wet;
- 2 for freezing: there are signs of mould, the item has priority and is saturated, the item is printed on coated paper and has not yet blocked,[6] or the Evaluation Manager so decides;
- 3 for replacement: if the item is known to be readily available, it may be simpler and cheaper to replace it;
- 4 for discard;
- 5 no action required.

It is a law of nature that what cannot be found will be wanted, so it is necessary to record the decision. It is not strictly necessary to record every item. If most items are going to be air-dried and the treatment area is secure, it should be possible to retrieve them from there – as long as items coming into the treatment area are treated in turn. Items going elsewhere should be recorded by whatever brief identifier is appropriate, e.g., call number, catalogue number, file number, together with a check mark against the applicable destination column on the record sheet. If the item is then packed in a crate, that crate number should also be included.

As soon as it is possible for the Evaluation Manager to estimate the amount of material likely to require freezing, the Disaster Controller should be advised so that arrangements can be made with the freezing facility.

If it is decided to discard items, the team should record why this decision was made. Rash decisions should be avoided as the team may be called upon later to justify their actions.

Packing

As noted above, some action by the packer may need to be moved ahead of action by the Evaluation Manager. If the Evaluation Manager is at such distance from the disaster site that transport must be used, then the packing operation may have two separate segments.

1 Packing material to travel from the disaster to an off-site treatment area

The packers' operation should be set up near the salvage area. As material comes from the disaster site, it should be packed carefully in cartons, milk or bread crates and taken by trolley to the transport vehicle. If the material has been deformed (e.g., by falling into water or being crushed by other items or by equipment), no effort should be made to flatten or straighten it at this stage. It should be placed carefully in the crate or carton and sent to the Evaluation Manager. If the treatment area is nearby, materials may be taken by trolley direct to the Evaluation Manager.

2 Packing material post-evaluation

The packers' table should be set up near the Evaluation Manager. The packer will need a table, crates and labels.

Material for air-drying can be placed on trolleys and filled trolleys taken to the treatment area by the transport organiser. If material is to go to another level and lifts are not available, it will need to be carried in cartons or crates.

Material for freezing must be packed carefully. It is necessary to separate the book from its neighbour; if this is not done, the books will freeze together. If books are packed vertically, then this should be done with the spines down. The crates should be filled leaving some expansion space. If bread crates are used, the items should be laid flat. Files should be wrapped in batches, no more than four inches deep. Care should be taken to lay the items flat in bread crates and with the largest item on the bottom – otherwise the top book or file will sag and permanent damage will result. The crates should be numbered (using luggage labels) and the number added to the treatment record.

When an agreed number of crates has been filled, the Disaster Controller will arrange for their transport to the freezing facility.

Air-Drying

The treatment area should be secure and access restricted to those working on the disaster. Sightseers will get in the way, and material may be lost. The treatment area should be set up to provide:

The logo consists of the word "Seismic" in a grey sans-serif font, with "Isolation" in a smaller font size directly below it. To the left of the text is a stylized blue "S" shape that overlaps the "Seismic" text and extends downwards to form the base of the "Isolation" text.

Scenario 9. If a Decision Is Not Recorded

A fire occurred two years ago in the archives area of a private college. A new archivist has been appointed and, as part of his familiarisation process, is reading the reports of the fire and its aftermath. He is deeply dismayed to find that a number of diaries describing the early history of the area were discarded by the evaluation team. Although this action may have been correct, he does not see any reasons given. The staff member who headed the evaluation team has since moved to another job, and other staff are not aware of the justification for the discard. The archivist feels that other solutions might have been considered; for instance, the diaries might have been photocopied, or it might have been better to retain them in their damaged condition in the hope that later technology might have been able to restore them. The archivist is quite critical of the action taken, and there is some resentment from staff who worked on the disaster recovery.

What Could Have Been Done

The Evaluation Team should have recorded the reasons for their decision to discard this material. While their decision might still have been questioned, their reasons would have been clear to those reviewing the situation at a later stage. Their decision may, on the other hand, have been totally correct in the light of the information which they had at the time.

- * an area for unpacking/unloading;
- * tables for the interleavers;
- * tables or floor areas for the books or other materials to be placed for air-drying and fans;
- * a table for the supplies provider to organise needed supplies.

On receipt of the material the unpacker should quickly check the material. Even though the Evaluation Manager has selected this material for air-drying, it may be that, by the time it reaches the treatment area, its condition has changed. There may be material which does not need treatment, is not worth salvaging, or should be frozen after all; this material should be referred to the treatment team leader. The unpacker should not spend a lot of time on this – this provision is just to indicate to

the unpacker that any doubts may well be worth referring to the team leader. Otherwise, the items should be taken to the interleavers' tables and left, books upright on paper towelling with the cover slightly open until the interleaver is ready to handle them.

Supplies. Supplies needed will include:

paper towels	-	for interleaving
fishing line	-	for suspending pamphlets
cardboard	-	for supporting racks or wind tunnels
plastic sheeting	-	for constructing wind tunnels
thin plastic or rubber		
gloves		
scissors, knives		

The supplies provider should make sure that the interleavers have a constant supply of paper towelling separated into sheets.

Interleaving. The interleaver will place sheets of paper towelling approximately every 1cm through each book. Loose papers may be interleaved at a similar spacing. Where the item is printed on coated paper, the sheets should be placed between *every page*.[7] If the item is a pamphlet, then it need not be interleaved but may be hung on a line to dry or supported on racks.

Drying. Books should be placed on end before an electric fan, with the pages lightly fanned.

Where items will not stand unsupported they may:

- * be hung on lines;
- * be supported on drying racks, e.g., cardboard folded in concertina pleats and anchored to the table top;
- * for loose sheets of paper, laid flat with the fan directed towards the ceiling.

The items to be dried should be set up in a orderly manner so that checking can be carried out easily. Plastic sheeting may be placed in lines across the floor and the books placed upon these lines.

The drying process can be expedited by the construction of wind tunnels – basically, a tunnel constructed from cardboard or plastic sheeting so that the passage of air is concentrated on the materials to be dried.

The drying process should be monitored and, after a period of time indicated by the team leader, the items should be returned to a second team of interleavers so that the interleaving can be replaced.[8]

Do not use heat. Heat will increase the humidity and encourage the growth of mould.

Non-Paper Materials

Generally speaking, expert help should be sought in the treatment of non-paper materials.

Magnetic media. While an essential part of disaster planning involves the backing up of computer tapes and disks, it is inevitable that items lacking such backup will be involved in disasters. *Do not attempt to make copies – you may damage hardware.* Call for expert assistance. Magnetic tapes have been washed in clean water and hung to dry.[9] When dry, the tapes were re-recorded and the damaged tape discarded. Any magnetic media commercially available is better replaced.

A similar procedure may be followed with audio and video cassettes.

With 5 1/4 inch floppy disks it is possible to slit the disk jacket, remove the disk, rinse in clean, tepid water, dry in still air and replace in a new jacket. The disk should then be copied and the original discarded. The rigid nature of the jacket of 3 1/2 inch floppy disks makes such treatment more difficult, but it can be done.

Compact disks. The Disaster Plan of the University of Maryland recommends that compact disks be washed in a 1% non-ionic wetting agent in distilled water made especially for cleaning compact disks, and then rinsed with cool distilled water.[10] Holding the disk by the edges, wipe gently in a straight line from the centre to the outside edge. Do not use hair dryers or similar to blow off water or dirt.

Sound recordings. A deformed phonographic disk cannot be restored. If the disk is not deformed but is dirty, then it can be washed in distilled water. A soft brush should be used and the disks placed vertically in racks to dry. Be careful with cardboard jackets; they are likely to trap mould spores. It is probably better to discard them. Remember to transfer any identifying information to the new cover.

Silver halide and motion-picture film. Keep in clean, cold water and send to the nearest film processing laboratory as soon as possible. Do not allow materials to remain under water for more than three days. Colour negative and positive film should not be kept under water for more than two days.

Vesicular and diazo microfilm. Wash off under clean, running water and air dry.

Microfiche. Microfiche can be separated and air-dried but may spot or scratch. If replacement is possible, then this is simplest.

Colour slides, transparencies. These are difficult to save; the colour will fade and colour layers will separate. They can be air-dried, but do not handle on the image side. Remove any mounts (remembering to preserve any identifying information).

Photographic prints. If they can be given rapid attention, photographs can be air-dried successfully. Remove from any mounts and place, emulsion side up, on blotters or lint-free cloth. If there is likely to be delay, they are best frozen as there is a danger of the prints sticking to each other or to surrounding surfaces. Freeze-drying is not recommended; it is better to thaw the prints later and then air-dry them. Colour photographs are hard to salvage as the dyes will fade quickly.

Basically, the advice for magnetic and photographic media is: if the material is of value, call in professional help as soon as possible.

Small-Scale Disasters

Up to this point the disaster discussed has been of a substantial nature. Where the disaster is of a lesser scale, it may be appropriate for the same team of people to salvage the material and then treat it. In such a case a team might consist of:

- 1 team leader
- 2 evaluator/recorder
- 3 five team members to salvage and then treat material.[11]

Following the first steps, clearance to enter, and assessment of priorities, the team leader should select a treatment area, have the disaster bin and equipment collected, and evaluation, interleaving and treatment tables set up in the drying area. The team will then retrieve the material, bring it to

the evaluation area and carry out the appropriate treatment. If the department or library has insufficient staff to form such a team, they should look to volunteers and would be well advised, when setting up the plan, to give thought to the best source for these volunteers.

Staff Morale and Safety

The onset of a disaster usually finds staff willing and ready to help. The work, however, is dirty and, once the first enthusiasm has worn off, monotonous. It has been said that the level of enthusiasm usually takes a dip after about seventy-two hours. We need, therefore, to ensure that that seventy-two hours is spent as productively as possible. There is also the converse problem: the overenthusiastic staff member who may injure himself.

It is necessary to maintain enthusiasm, and it is necessary to maintain health. Staff should work in shifts of not longer than thirty minutes and then change to a different task within the recovery process.

Safe Working Practices

The controller should ensure that appropriate lifting methods are used; for example:

- * lifting with the back straight, the load close to body and the legs taking the strain;
- * using two people to lift heavy loads;
- * using lifting equipment when available.

Staff in the treatment area should, as far as possible, work at tables.

Rest and Refreshment

Make sure that staff have regular breaks for rest and refreshment. It is morale-boosting if the organisation can arrange for the refreshments to be imaginative and varied.

Communication

All staff, whether involved in the disaster recovery or not, should be fully aware of the progress of the recovery. Sightseers are of no benefit to anyone; and if staff feel that they are being kept fully informed, they are

less likely to come and watch. Teams should be regularly briefed, while the organisation should consider circulating regular bulletins on the progress. Suggestions from staff should be welcomed – not only may a disaster plan based on theory benefit handsomely from experience, but even a plan based on practical knowledge can be improved. The Disaster Plan of the State Library of Queensland suggests:

Establish a memo system so that ideas which will assist efficiency and safety are shared in an appropriate way. This may involve a clearly marked tray placed near the Team Leader, with blank 3 x 4 cards and pens. It is important to encourage ideas, while ensuring that the team leaders and coordinators are not disrupted continually. Make sure that all ideas, whether appropriate or not, are encouraged.[12]

An admirable example of the dissemination of information to staff was provided by the City of Knox after their municipal chambers were damaged by fire. On the following day the Buildings Manager went through the building accompanied by a video camera operator. He talked about what he saw in an informal manner. He showed what had happened in particular departments, what had suffered severe damage, what was relatively unscathed, and he also showed the little things: a guitar which had been burnt, a football poster which had survived. As he went, he talked directly to the staff involved in the areas he was showing, e.g., 'The Jason Dunstall memorial wall is still here, Kylie.'[13] So, although staff were unable to enter the building, they knew very clearly what had happened.[14]

Leadership is very important, the recovery team should be seen to have the support and confidence of the organisation's management.

Morale

Staff will come to disaster recovery in varying degrees of stress. If the disaster is area-wide, they may have concerns about their family or homes. They may have family trying to reach them.[15] If the disaster is limited to the organisation, staff may still be upset by the disruption to their routines, by the destruction of projects in which they have invested their time and their skill, or by the destruction of valued collections. It is important for the Disaster Controller to be aware of these concerns. If the disaster is severe or area-wide, it may be that counselling services will be required.

Scenario 10. Safe Working Practices

The College Library has always been a harmonious place. The staff get on well, are interested in their work and take a pride in the service which they offer. A water pipe has burst and there is extensive flooding. The stock is severely affected. The water damage (from a burst pipe) has been contained. The area has been surveyed and the priorities established. As it is vacation, the college's cafeteria is not in use and has been commandeered as a drying area; a team commences operations there. Teams are collecting material from the disaster site and bringing it to the cafeteria. They are upset by the damage which their library has suffered, and they have been working very hard. A staff member taking books from a bottom shelf to place on a trolley suffers an acute pain in her back and is forced to go home. After seeking medical advice she discovered that she has injured a muscle in her lower back. Other staff, after going home at the end of the shift, find that they are exhausted and are stiff and sore the next day. As the books set out for drying in the cafeteria are on the floor, it is difficult for the staff to operate, and complaints of back pain continue to arise.

What Should Have Been Done

The library's valuable resources include its staff. Their anxiety to help is commendable, but it must be monitored to ensure that they do not damage themselves while doing this. Staff have worked 'flat out' for six hours. The Disaster Controller should have ensured that they were rotated among the various jobs which they were doing, for instance: 30 minutes retrieving material, 30 minutes transporting material to the air drying site, 30 minutes working in the air drying area *and then a rest break*. Library management should ensure that refreshments are available – and are attractive. The Disaster Controller should make sure that staff are using safe lifting methods. The staff member injured was taking material from a bottom shelf; was she taking the weight on her thighs, or was she stooping and taking the weight in her spine? And remember, not all staff will be physically fit; if they feel that they are becoming stressed, they should be encouraged to take a break. It is better to have them available the next day rather than out of action for weeks.

Once the disaster is over, the management should make a point of expressing its appreciation and thanks to all who assisted with the recovery. Staff may wish to mark their involvement in some way; staff of the National Library wore T-shirts declaring, 'We survive flood and fire'.[16]

Restoration of the Disaster Site

Restoration of the disaster site should happen concurrently with the materials recovery. If the damage is slight, it may be carried out by the maintenance and cleaning staff of the institution; but if the damage is great, work is best carried out by a commercial company. Care must be taken, whatever the degree of damage, not to replace material until the humidity is at an appropriate level, and the area should be checked for mould for at least twelve months. The relative humidity in the area should be maintained at $48^\circ \pm 2^\circ$.

Review of Procedures

An important aspect of disaster recovery is assessment, review and reporting. Once the disaster has been contained and the recovery procedures completed, the Disaster Controller should carry out a careful review of the procedures which were followed. If the plan was totally successful, then the Disaster Controller and his staff are to be congratulated. It is more likely, however, that aspects will need rethinking. The plan may well have been too optimistic; assumptions may have been made which were not warranted. Too much time and resources may have been allocated to aspects which did not deserve it, while other operations were starved. The plan should be reviewed in the light of experience gained. As part of the preparation for this book a number of institutions which had experienced disasters completed questionnaires. Some had had a plan and were reviewing it, but a surprising number had not had a plan and had not taken steps to develop one. A well-worn statement says that those who do not learn from history are condemned to repeat it.

A full report should be prepared. The report should be thorough and should discuss frankly both failures and successes. It would be very helpful if the report could be published or, at least, its availability made known. The experiences of those who have gone through disasters are invaluable for those whose knowledge is theoretical.

Organisation of the Plan

As part of the aim of the plan is to be as simple and straightforward as possible, the duties of the separate teams – salvage, evaluation and recording, packing, air-drying and treatment of non-book materials – should be so written that they form what the National Gallery of Victoria has called 'Action Sheets'. That is, the procedures for each team are printed on a separate page so that the team can carry a copy of their instructions with them. There is no need for the salvage team to have the instructions for the air-drying team; when their schedule calls for them to be rotated to another area, they can pick up their instructions when they reach that point. The one list of duties which cannot be reduced to a single page is that of the Disaster Controller who will need to operate from the entire manual. Having responsibility for the procedures, the Disaster Controller, however, should be sufficiently familiar with the procedures to have little need to refer to the written manual.

In addition to reviewing the plan after its use in a disaster it is essential that there be a regular review, say, every six months. This will keep the plan in accord with changes in locations and changes in staff. It is a good idea to link this revision with staff training; this will be addressed in the following chapter.

Part 2: The Appendices

It is necessary to examine your own situation very carefully. CAVAL Ltd has identified five questions which should be resolved:

- 1 **What do you have?**
 - a careful listing of the contents of the department, archive or library.
- 2 **What do you want?**
 - of the materials identified, which ones should have priority for salvage and retrieval?
- 3 **What is the environment, and what are the work practices?**
 - are there dangers stemming from the building's location or which exist in its fabric? Are potentially dangerous practices followed?
- 4 **What skills are available, either from staff or from outside consultants?**
 - people on the staff will have skills which will be useful.
- 5 **What supplies will be needed?**

- certain basic supplies will be kept on hand, others must be obtained from outside and likely sources identified.

What Do You Have?

Probably most professionals would say that they know what they have in their organisation. It is best, however, to make sure. There is a danger of being so familiar with an object that its presence is not noticed. Anybody who has moved house knows that surprising items will turn up and would not have been found had there not been a systematic clearing of a particular area. A carton on top of a range of shelving may contain junk, but it may also contain forgotten but valuable material.

A disaster need not be cataclysmic. It is more likely to affect an office, a floor or a wing, and this is how an assessment of contents should be approached. It is necessary to take each area in turn. The result could be something like:

Level 1, Room 101	University Librarian	Series of 3 Prints (by W. Xyz), Files relating to (list)
Level 1, Room 102	Deputy Librarian	Files for new building planning. (...)Manuals, files relating to (list)
Level 1, Room 105	Administration Office	Staffing and budget files, key control cabinet and records, equipment and furniture registers.
Level 2, Room 219	InterLibrary Loans	Books from other libraries, records of items borrowed, requested. Operating manuals

and so on for the rest of the library, archive or records system.

What Do You Want?

Once it has been established what is held, the next step is to establish which of the items identified should have priority in the case of a disaster. Here we may be looking at a number of factors. The priority items in one sort of institution will not necessarily be those of another. One institution may hold items which form part of the national heritage; another may hold material needed immediately by users (for instance, critical texts in a university library); another may hold items of importance for local historians. The records of a commercial firm will contain material vital for the survival of the firm, or material whose loss may expose the company to legal action. All institutions will hold business records, files and systems necessary for the operation of that body. Deciding on the priority items will require careful assessment, and some decisions may be quite unpalatable for individual staff members. Realistically, there is a limit to how many items may be selected for first priority retrieval and staff may need to accept that a cherished item has not been included.

There are four levels of classification:

- 1 What is vital to the institution as a whole?
What are the vital items for which the institution is accountable?
e.g., correspondence of a notable national figure, or collections of early historical manuscripts.
What items are essential for the institution to continue operation? e.g., contracts and legal documents not held elsewhere in the organisation. Items which are readily replaceable should not be included, e.g., manuals or computer disks which are commercially available.
- 2 In each geographical area (i.e., floor and/or wing) what should be priority material?
e.g., South Wing, Interlibrary loan books
 Level two, Room and records
 219
- 3 In each individual office.
In this case the location in the room should be specified; the interlibrary loans staff may not be present when the material is retrieved.
- 4 Material without priority.
Probably the bulk of the material held. This is not to say that this material has no worth, but it must take a back seat to that which is vital for the organisation.

The record might look something like:

Room	South Wing Level 2	Item	Location
219		ILL items awaiting collection Items/requested, issued	Shelving to right of door File drawers on desk[17]
225		Pioneer archives*	File drawers A, B and C

* Library first priority

The record must be arranged by area as it is the *area* which will be affected. If the area contains items which have priority for the library as a whole, then that should be clearly established. In the example given, if the disaster affects either the entire South Wing or the entire second level, then first priority must go to the Pioneer Archives. If it is something affecting Room 219 but not Room 225, then the interlibrary loan items and records have priority and their location is indicated so that they may be identified and removed with all due speed. An automatic part of any reorganisation must be the revision of this list; indeed, it should be regularly reviewed when the procedures are reviewed.

What Is the Environment and What Are the Work Practices?

This is a matter which should best be addressed by the management of the institution in consultation with the Disaster Controller. Identifying, prioritising and resolving problems will require the authority and, most importantly, the financial resources of the management. The Disaster Controller, however, must be fully aware of the decisions which have been made and the justifications for them. Preventive methods are discussed in Chapter 2.

A warning!

At this point the organisation should give careful thought to what has been done. The organisation has identified what it values, and it has identified where it is vulnerable. This is not information which should

be readily and widely available. Even the most benign organisation may have employees or clients who are disaffected, and this is not information which they should be able to access. The organisation may, consequently, decide to restrict this part of the plan to certain identified key staff. If one of the hazards is vandalism, it is not a good idea to provide the vandals with a valuable source document.

What Skills Are Available, either from Staff or from Outside Consultants?

Every organisation has *key staff* who will be invaluable in coping with a disaster. There are, first, the staff who have responsibility for the building: the building manager and his staff. Then there are the people on whom he will call: the electrician, the plumber, the carpenter and the cleaners. There are experts to whom recourse can be made: conservators, computer experts, occupational health and safety staff and, most importantly, the insurance agent. Another outside source of skill can be, as discussed in the previous chapter, the commercial disaster recovery firm.

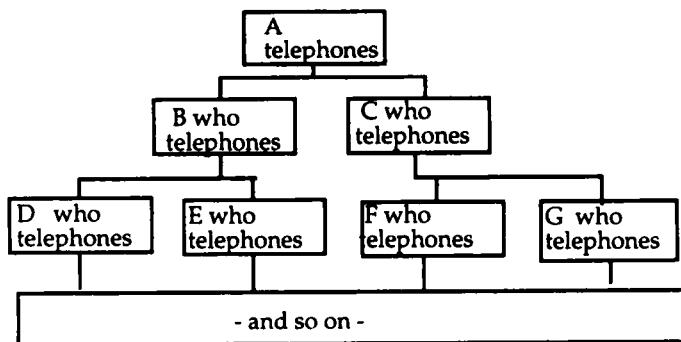
All these people should be recorded, together with their telephone numbers, and the list should be checked regularly to ensure that it is up-to-date. There are immutable facts of organisational life: key staff leave and reorganisations happen. It is not good to 'phone the electrician and discover that he is no longer there. With this in mind it is a good idea to list the key staff by expertise rather than by name, for example:

Electrician... Ext. 354, rather than

Joe Bloggs, Electrician... Ext. 354

The organisation will have disaster recovery experts of its own: there will be the Disaster Controller and those members of staff who have been trained in disaster recovery. There will be the staff who have detailed knowledge of the collection and records, the people who can evaluate material as it comes from the salvage site and make rapid and accurate decisions at a level of detail. Perhaps there are people who have responsibility for certain physical areas.

It may be appropriate to establish a 'telephone tree' for use after hours. This will list the members of the recovery team in such a way that the responsibility for contacting them is spread, for example:



What Supplies Will Be Needed?

There are basic supplies which can be used to limit the extent of a disaster and to handle its recovery. These items can be kept in a disaster box or bin – wheeled 240 litre rubbish bins are admirably suited to this purpose – although it will be necessary to fit locks to the bins. If this is not done, it is common to find that people have put rubbish in on top of the supplies. The other probability is theft, as the contents can be attractive.[18] The contents of a bin usually include:[19]

Quantity	Description	Quantity	Description
50	Baggage labels - for labelling crates	5	Masking tape (rolls) - for attaching plastic sheeting, etc.
20	Bin liners (74 litre)	2	Mops/squeezes with handles
2	Buckets, square (10 litres) - for initial cleaning up	500	Newsprint, blank (sheets) - for interleaving
1	Chalk, coloured (box) - for delineating areas	2	Overalls, disposable
2	Clipboards - for record sheets	2	Paintbrushes - for cleaning mud, etc. from items
10	Face masks - to protect from mould	4	Paper towels, perforated (rolls) - for interleaving

1	First aid kit	5	Pens, waterproof - for writing labels
500	Freezer bags - for items intended for freezing	1	Polythene sheeting - for channelling water, protecting items
25	Gloves, latex (pairs of)	2	Scissors (pairs of)
20	Gloves, plastic (pairs of)	3	Sponges (large)
2	Goggles, plastic safety	2	Torches with batteries
3	Greaseproof 'go-between' (rolls) - for wrapping materials for freezing	6	Whistles
2	Protective aprons	2	Writing pads
1	Disposable camera - for recording disaster and recovery progress		

The disaster bin forms a basic 'starter kit' and will need to be augmented by other more substantial and/or bulky equipment such as wet/dry vacuum cleaners (carpet shampooers as hired out by supermarkets can be used for this purpose), portable generators, two-way radios (preferable to mobile telephones as these may experience 'dead spots' in a large building), large fans, pallets, bread crates, trolleys, transport and access to freezing facilities. Sources for these items and services should be identified and listed, together with contact telephone numbers. Remember Kathleen Coleridge's experiences (Chapter 1); supply of required items may not be as straightforward as the plan suggests. Backup suppliers are a good idea. If there are a number of organisations in reasonable proximity, a cooperative central store could be established. This has been done in Adelaide by the institutions along North Terrace.

The North Terrace Disaster Store. This store is maintained by Artlab Australia and is available to all contributors who have paid an establishment fee. There is an annual maintenance fee for replacement and upkeep of the store, equipment and materials. Surplus funds are used to purchase new items of equipment or materials. The maintenance fee is used to replace consumables used in minor disasters, while consumables and equipment in major disaster situations are borne by the user. All contributors are jointly responsible for materials and supplies held by the store. Once items are removed from the store, they become the

responsibility of the contributor until they are returned. Each contributor holds a key to the store. The store contains some mobile garbage bins ('Wheelie' bins) for small disasters but also such items as:

...a petrol operated generator and jerry can positioned on a trolley for ease of operation, large pedestal fans, dehumidifiers, small and large wet and dry vacuum cleaners, sack trucks and several sizes of plastic bins...a few of the more specialised items include lights for night work, flashing hazard lights, hard hats with lights attached, rolls of polythene and Tyvek, drop sheets, dining canopies, knee pads etc.

We plan in the near future, to purchase various sizes of steel capped rubber boots and Tyvek suits, as there is no guarantee that people will be appropriately attired in case of disaster.[20]

Individual institutions may decide not to include protective footware as size will vary so much. In this case the recovery team should be expected to supply their own protective boots if required or otherwise wear substantial protective footwear. Safety helmets are also needed but should be available as part of the institution's safety equipment.

Discussion should also take place with the organisation's insurance agent. The agent's permission should be sought to take immediate recovery action when a disaster occurs. He may wish to be provided with a copy of the disaster plan. If immediate action is taken, it is highly probable that any insurance claim will be minimised. It may also ensure, as Jennifer Borrell suggested after the 1990 floods in Maitland, that the insurance claim is processed with little delay because of the expertise of the disaster recovery. The agent's response should be sought in writing and copies placed within the plan. The camera can be used for recording the disaster and may be used to support any insurance claim. Part of the regular review of the plan should include an annual replacement of the cameras – the old ones may, as happens at the University of Ballarat, be offered to staff (with the rider that they may have passed their 'use-by' date).

All this information will serve as source and reference material for the disaster plan and is properly located in the appendixes. Do not clutter up the plan with it.

The basic appendixes to the disaster plan are:

Appendix 1	Listings of material for priority recovery
Appendix 2	Key staff and telephone trees
Appendix 3	Preventive checklist (completed)
Appendix 4	Supplies

To these can be added a fifth appendix, master record sheets: a priority listing proforma, a record sheet for recording treatment of damaged items and a time sheet for recording overtime worked or work by casually employed staff. If the organisation has policy statements concerning disaster recovery, these can be included as a sixth appendix. Policy statements are useful if authorisation for action is required, but they do not belong in the body of the recovery plan.

Notes

- 1 The disaster plan discussed in this chapter is based on that produced by CAVAL Ltd, *Disaster Recovery: A Model Plan for Libraries and Information Centres* (Melbourne: CAVAL Ltd, 1993).
- 2 The author worked in a library where a storeroom officially designated as 10.3.7 was still known to all library staff as LG18.
- 3 An excellent reason for wearing substantial footwear and *never* working in bare feet.
- 4 CAVAL, *op. cit.*, Flow chart 1.
- 5 We recommend that the lists of duties for each team (being approximately one sheet in size) be separately copied and laminated or placed in sheet protectors and that these be given to the teams as they commence action.
- 6 If the item has blocked (i.e., the pages have stuck together), it is likely that nothing can be done – although where blocking has occurred at the edges only and the item will lend itself to such treatment, it may be possible to trim these edges.
- 7 As this is obviously a very time consuming and tedious operation, serious thought should be given to the possibility of replacing items so affected.
- 8 The paper towelling may be dried by the supplies provider and reused.
- 9 An interesting account of such a procedure can be found in Winston Atkins, 'Coordinating a Bomb Blast Recovery.' *Conservation Administration News* 55 (October 1993): 1-2, 24.
- 10 University of Maryland at College Park Libraries. *Disaster Plan* [Web document]. Available URL:
http://www.itd.umd.edu/UMS/UMCP/TSD/disaster_salvage.html
- 11 If there are fewer than five people on the staff, consideration should be given to calling in volunteers. Much of the work done is simple

- in nature, and spending time briefing staff is preferable to staff injuring themselves by attempting to do too much.
- 12 State Library of Queensland, *Emergency Action Plan, Salvage of Collections*, Section 2.1.2 Briefing (Brisbane, 1994).
 - 13 For those who do not follow Australian Rules Football, Jason Dunstall is a footballer of note.
 - 14 City of Knox, *Fire Aftermath* (video).
 - 15 The telephone log at a library involved in the Los Angeles earthquake showed schools calling about children to be collected, baby-sitters unsure of what to do and relatives from interstate enquiring about the safety of their family members.
 - 16 'Courting Disaster.' *InCite* 8,2 (20 February 1987): 7.
 - 17 If records are computerised, there should be procedures for a regular backup of records and these should be kept in a separate location.
 - 18 The author had one bin totally emptied and still wonders what they used the sheet plastic for.
 - 19 CAVAL, *op. cit.*, Appendix 4.
 - 20 Sarah Jane Rennie, 'The Development of Counter-Disaster Plans in South Australia,' in *Redefining Disasters: A Decade of Counter-Disaster Planning* (Sydney: Conservation Access, 1995), p. 210.

4 Training the Teams

Even the best disaster recovery plan will work poorly if staff are not familiar with it. As well as ensuring that his team is well trained, the Disaster Controller must be sure that his own skills are regularly updated.

The Aims and Purpose of Disaster Training

The Disaster Controller needs to be familiar with the problems which may be faced and with the procedures which will address them. While responsibility is placed upon him and there is confidence that he will lead the teams intelligently and efficiently, it will be easier for him if the teams are already comfortable with the plan and its purpose. Misfortune may well ensure that the disaster occurs when the Disaster Controller is ill or on leave, so other staff should be familiar enough with the plan and its procedures to fill in for him if necessary. Training is aimed at staff who will take leading roles in the recovery. These staff members will head the salvage team, the transport team, the air-drying team or will locate and control supplies. Most of the duties which will be required of team members under their direction are simple, for instance, removing materials in a directed manner and taking them to a specified place, or placing sheets of paper towelling at directed intervals through a book. This training is best done on the job. The team leaders, however, need to carry out these duties in training so that they have some appreciation of the work that their teams are carrying out and the time involved. With this in mind they can avoid, on one hand, possible overwork or, on the other, boredom.

Attitudes of Staff at Training Sessions

Many of those attending training sessions will be aware of the problems faced in disaster recovery and will be keen and eager to learn. Some will

be there because their institutions have suffered disasters and they are now motivated to set up disaster recovery plans and procedures. Some, however, will be there because their senior officers sent them. In internal workshops attitudes may range from interested and involved to sceptical to bored to the feeling that it is all a bit of a giggle! This is not intended to suggest that the trainer will face a blackboard jungle but rather that the trainer may need to involve the attention of the workshop members before proceeding with the program.

Scenario 11. Speaking to the Right People

The External Workshop is in full flight. There are twenty-eight people present from a wide variety of organisations. The first session, in which the trainer discussed disaster recoveries with which he had been involved, went very well. The very graphic slides which he showed were an important part of this. During the next session, when the trainer discussed the development of a department plan, there was a certain restiveness apparent. During the lunchbreak one seminar member says, 'This is all very well but I'm not going to be writing a plan for my place. The bosses will want to do that. They want me to find out how to handle materials.' Another says, 'I think this is good and it should be done but they are not going to listen to me.' On further discussion it turns out that both these members are quite junior and were sent because their managements thought that someone should know something about disaster recovery and these staff were seen to be available. They (and a couple of others in similar circumstances) enjoy the workshop and feel that they have learned from it but go away feeling that their recommendations will have little weight.

What Should Have Been Done

In its preliminary publicity the workshop should establish the level of staff member which it expects to attend. If it is aimed at people who will return to their institutions to set up disaster recovery plans, this should be made clear at the outset. If junior staff are sent because it is vaguely felt that this sort of thing is in their area, this will be a waste of money if they are not listened to on their return to their home institution. Institutions should be sending their potential Disaster Controllers. If this is going to be the junior staff member, then those staff members should be clear about this. It would be useful if workshop registrations were then acknowledged by both some basic briefing notes and a syllabus establishing the expected training outcomes.

It is useful if external workshop members have some understanding of the project before attending and so it will help if they are sent a handout and syllabus together with their acceptance for the workshop. This handout can briefly describe the effects of disasters as well as the techniques used to address damaged items. A syllabus might establish:

External Workshop: Sample Syllabus

Purpose	To provide the learners with the knowledge and skills necessary to develop a disaster plan for their home institution and to act, if required, as Disaster Controller.
Prerequisites	Those attending should hold such positions in their home institutions as will enable them to direct a disaster recovery.
Contents	<p>History, nature and scope of disasters.</p> <p>Evaluation of environmental factors which may threaten collections.</p> <p>Identification of items for priority retrieval and an appreciation of how these may differ according to the institution involved.</p> <p>A consideration of insurance.</p> <p>A consideration of human factors.</p> <p>Writing of a disaster plan</p> <p>Practical experience of disaster recovery:</p> <ul style="list-style-type: none"> Salvage Evaluation and recording decisions Treatment
Outcome	<p>At the end of the workshop those attending should be able to:</p> <ol style="list-style-type: none"> 1 Prepare a disaster plan <ul style="list-style-type: none"> (a) Identify potential threats to collections (b) Recommend action to address such threats (c) Negotiate with colleagues to identify items for priority retrieval (d) Achieve acceptance of these decisions from colleagues (e) Prepare a Disaster Plan

	<ul style="list-style-type: none">2 Train colleagues<ul style="list-style-type: none">(a) Identify team leaders(b) Run internal training workshops on an annual basis3 Act as Disaster Controller
Delivery	The workshop will include classroom discussion of the theory of disaster recovery as well as practical experience through a disaster simulation.

Opening Gambits

Trainers have used many methods. Randall Butler speaks of introducing them initially to a 'disaster site' so that they can see the sort of situation which they may face.[1] He runs a first session of forty-five minutes in which those attending are introduced to the 'disaster site' and given time to think about how they might deal with it. He then takes them into the workshop proper where they begin to consider the theory of disaster recovery. Randy Silverman, on the other hand, says: 'First I like to get people's attention, so I begin by pouring 10 gallons of water over a variety of library material in a pan, describing the situation as Friday night before a long weekend.'[2] He goes on to show slides of all types of disasters, some of which he has worked on: 'This helps establish that it is common to suffer from unexpected problems as a collecting institution, and also establishes my credibility from an experiential point of view.'[3] Kim Morris, Conservator at the National Library of Australia, does something similar:

Jaws dropped as conservator Kim Morris submerged old hard-cover books, paperbacks, reels of microfilm, photographs and other library 'documents' in a bucket of water, announcing his intention to leave them there all day and to check on them from time to time.[4]

He uses this exercise to make some useful points about the absorption rate of water upon a closed book. This will be discussed later.

Another effective technique was used at the CAVAL workshop 'Mission Mooroolbark'. The workshop began with discussions of three disasters by people who had experienced them: a flood at the library of the National Herbarium where gutters had overflowed during a violent

rainstorm; a fire which had destroyed municipal offices of the Knox City Council; and, presented by one of the workshop participants, damage suffered when computer equipment caught fire and soot spread through air-conditioning at the Torrens Valley Institute. The personal experiences of the presenters and the trauma suffered established a feeling of immediacy for the following sessions.

Having, it is hoped, imbued all attending with a feeling of the worth of the training exercise, the trainer can move on to the substance of the workshop. The workshop should consist of both theory and practice and, ideally, should include a simulated disaster site – although local circumstances may render this last impractical. An external workshop can run for around two days, while the training session for staff of a specific institution may be restricted to one day.

Workshops which differ from this pattern have been run by Gregor Trinkaus-Randall of the Massachusetts Board of Library Commissioners. His workshops are run in three stages with the aim of allowing participants to develop their own recovery plans in the meantime:

The first session focused specifically on background materials and the administrative procedures necessary in putting together a plan. Materials covered were external and internal surveys, resource lists, phone lists, possible approaches in gathering information and developing staff support for the plan (including the director), potential problems, development of cooperative relationships with other institutions, the philosophy behind and components of such a plan, etc.[5]

The Theory Segment

To run a theory segment will require a classroom with an overhead projector and screen and, according to the requirements of the trainer, a slide projector or VCR and monitor.[6] Those attending will be taking notes, so tables, or at least chairs with writing arms, should be provided.

Aspects which may be covered in the theoretical part of the workshop:

- 1 an *account of disasters* which have happened. This may be of disasters in which the trainer has been involved (as did Randy Silverman, University of Utah, and as did Jeavons Baillie, Head Conservator at the State Library of Victoria, at the 'Ballarat Is Burning' workshop) or a brief account of some of the better known disasters. This may be combined with the next topic.

- 2 the *damage* which disaster can cause. There are three main causes of damage:
 - (a) structural failure stemming from earthquake or accident. In addition to the failure of walls, fittings and furniture this may be followed by flood from fractured water pipes or fire from interference to power supplies.
 - (b) fire, caused by accident, carelessness or deliberate act. There may be consequent water damage as sprinklers are triggered or fire hoses used to extinguish the blaze.
 - (c) water damage, whether occurring on its own through flood, rain storms, malfunctioning equipment or as a result of extinguishing a fire. Mould may result as a consequence of unattended (or poorly handled) water damage.
- 3 *how to write a disaster plan*. The content of this segment is covered in depth in the previous chapter. Approaches which have been used include the following.
 - * One course, advertised on the Internet states that the course offered is for librarians and archivists from small libraries, archives and record societies in locations where expertise and resources are not readily available.[7] Participants are asked to draft preparedness and response plans for their own institutions during the course. This is obviously outside the scope of a two-day workshop, but the trainer indicates that this particular course will be week-long.
 - * Some workshops discuss prevention at length, particularly workshops held in California where reinforcement techniques to combat earthquakes are covered.[8]

Randy Silverman says:

I've had wonderful response from people...when I...involved the local fire departments. One option is to have a fire marshal 'walk' a building with us (being a group of 10 or so) pointing out the facility's fire suppression system and areas of concern related to building safety. Doing one of these walk-throughs in a library helps the workshop trainees visualise using their own fire departments for similar familiarisation tours, which opens up the dialog about high value collections in the building and ways the two groups can work together to become sensitive to the problem that these collections pose.[9]

Corporate disaster recovery workshops in particular may include segments dealing with legislation governing regulations, standards and codes.

- 4 content of a disaster plan can be reinforced, particularly for training in institutions which already have disaster plans (which, it is hoped, have been read by the participants) by the posing of a series of *hypothetical questions*, such as:
 - * You are phoned at home by Security Services to say that there has been a major fire in your building. What would be the first four things that you would do after taking the call?
 - * You take the first salvage team into an area which has suffered heavy flooding, e.g., the basement storage. What should have been established before you entered the area?
 - * An academic who is a very keen supporter of the library/archive arrives on the scene and says, 'I'll help you move this stuff out.' What would you do? What might be a useful area to involve him in?
- Some questions are answerable from the plan, others (e.g., the first and third cited) are common sense – and one of the aims of the workshop is to show that much action is governed by common sense.
- 5 the availability of *commercial disaster recovery companies* and the services which they offer. Representatives of these firms should be ready and willing to attend.
- 6 *insurance aspects*, particularly business interruption insurance for appropriate institutions.
- 7 *emotional stress*, how to recognise it and how to cope with it.
- 8 a display by the local *fire brigade* – especially demonstrating the surprising fire resistance shown by closely packed books on a shelf. One useful demonstration can show the force of water coming from a fire hose and provide the understanding that, if such a force is directed at a shelf of books, then they will be knocked to the floor.

Another workshop issued all participants with a disaster scenario and a mock disaster plan, divided the participants into teams and, using a detailed script, '...elicited and directed discussion on six topics: command centre, assessment of damage, evaluation of priorities, determining plan of action, assessing staffing requirements and assessing supplies and equipment needs.' [10]

Before undertaking this exercise the workshop was addressed on establishing priorities, on tracking materials through the response phase

and about implementing generic disaster plans. In the afternoon the trainees went on to retrieving and treating wet materials. The authors say that they are considering offering a workshop at an institution with an existing disaster plan and adjusting the scenario to fit. The work involved in establishing a disaster scenario and mock disaster plan (with detailed layout plans) sounds formidable – although probably only for the first time it is run. However, using this format for an internal training session with an existing disaster plan is an excellent idea.

The Disaster Simulation

The workshop should include practical experience. Local circumstances will govern the realism of the simulation. It may only be possible to stage a 'post-salvage' workshop, that is, a simulation which begins at the point at which the damaged material is brought to a treatment area for evaluation. Those attending will then have experience in deciding treatment, recording, packing for freezing and setting up an air-drying treatment. However, the more comprehensive the simulation can be, the better; if it is possible to set up a 'disaster site', this should be done.

Setting up a Disaster Training Site

The setting should be as realistic as can be managed. It should be:

- 1 Wet
There should be water on the floor, on the shelves and the materials to be salvaged should be thoroughly soaked. Somewhere with a concrete floor and with drainage is ideal; but if there is concern about the floor, it may be necessary to forgo the water on the floor and to cover that floor with plastic. The materials will still be wet but the plastic should protect the floor from damage.
- 2 Dark
In a genuine emergency it is highly likely that the electricity would be cut off.
Windows may be blacked out with black plastic sheeting. If the site is set up in a large room, a smaller area may be curtained off with black plastic.

3 Cramped

A genuine emergency might take place in an open and spacious area, but it would be unwise to have trainees expect this. Material is likely to have fallen to the floor and shelves may have given way.

Places which have served as 'disaster areas' include loading bays, changing sheds at swimming pools and a clay-modelling classroom. An enviable setting was used at Cornell University; John Dean says:

Cornell constructed a freezer building three years ago that is set aside for emergency relief for any library in the general region...our first simulation...was held at Cornell where we flooded a stack level and 4000 volumes just for practice. This tested both the teams and the newly-installed freezer.[11]

The teams at the Cornell University workshop, incidentally, came from a mutual response team formed by four university libraries in central New York State, so it is not just smaller institutions which can benefit from cooperative action.

Once a suitable site has been located, other equipment and areas must be identified.

- * Appropriate furniture must be found, e.g., shelving, desks, filing cabinets or whatever is appropriate to the organisations involved. This furniture will be thoroughly soaked and, therefore, can be faulty items destined for the tip. If dried after use, however, metal items should not be adversely affected.
- * A substantial sampling of the different kinds of materials which the organisations hold, again thoroughly soaked, placed on and in the furniture as well as on the floor where access will be obstructed.
- * Other areas should be identified for evaluation, recording and air-drying. The air-drying site should be reasonably large and flexible in its usage (that is, no fixed furniture).
- * Those supplies identified in a disaster plan as required to address the disaster, e.g., trolleys, fans, plastic sheeting, paper towelling, etc. (see the list of disaster supplies in Chapter 3).
- * A rubbish skip or substantial bins – there will be a lot of material to be discarded at the end of the workshop.

Setting up the workshop will take at least one half day. As far as the trainer is concerned, then, a one-day workshop is effectively one and a

half days, while a two-day workshop will take up two and a half days. Do not try to do this alone; the workshop will be a disaster in itself if the trainer is injured in the setting up. Keep in mind that setting up a disaster site is hard work. The windows must be blacked out, and it may be necessary to curtain off the area (these two actions may require scaling ladders to perilous heights). Shelving must be erected (it must first be scrounged from somewhere, and this is not always easy); materials must be soaked and placed on shelves, in filing cabinets or whatever the appropriate storage unit may be. A word of warning: it is not always easy to *keep* the material wet. If the site is set up the day before, then the organisers may be looking at soaking the items, by hose or by dunking, covering with plastic and then with repeated applications of water overnight and the following day. Obviously, if there is concern about the floor (and the ideal space is not always available), it may be necessary to keep the material soaked and shelve it at the last moment. Dismantling the site is easier as the trainees can be called up to help by taking the materials to rubbish skips.

If furniture is used, it should be arranged in a believable, but cramped, layout. The materials to be salvaged should be arranged so that there is a representative sample of types of material for each team. Some material and shelving should lie on the floor. If the set up is such that the first team into the disaster site clears the floor, then the trainers must see that the debris is replaced for each of the following teams.

Sequence

Ideally each team should go through the simulation in a logical order: salvage > evaluation > packing > air-drying; but if the trainers are faced with confined space and large numbers, this is sometimes difficult. In this case it may be necessary, but obviously less desirable, to start some teams at later tasks. Another possibility is to stagger the starts of the teams, i.e., Teams A and B start on the hour, thirty minutes later Teams A and B move on to the evaluation segment and Teams C and D commence salvage. The problem here is that the first teams will have to wait around at the end for the second teams to finish before the trainer can move on to a final discussion and review.

Briefings

As the simulation begins, the teams should be briefed. Briefing notes can be included in the workshop handouts. The following is a set which the author has used.

The Disaster Simulation Briefing Notes Part 1

1 Salvage

We have a disaster site set up. You should assume

- * there is no power available
- * you are unsure of the safety of the area
- * there is danger of mould occurring

You will be given a priority list and an instruction sheet.

Please resolve the questions raised on the instruction sheet before removing material. Please retrieve the material on the priority list – no more, no less.

2 Evaluation, recording and packing

The first group will have items provided, later teams should bring materials with them from the previous segment.

- 2.1 Again, resolve the questions raised on the instruction sheet before making decisions. Inspect the material as it comes out.
 - (i) Some material will be identified as valuable. These items are valuable for their content and should go to be frozen.

About freezing:

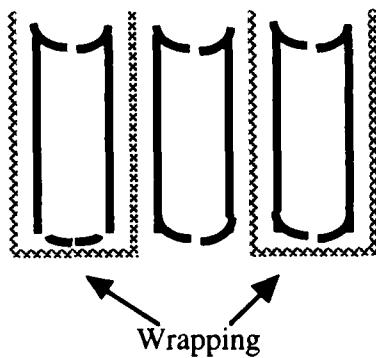
Freezing buys time – therefore you use it for material whose content is valuable and which you believe is too seriously affected for air-drying. Remember that coated paper which has already

blocked cannot be saved. Remember also that this material may well be unavailable for some time – freeze-drying takes time.

- (ii) Some you may feel is not worth saving and may be discarded
- (iii) Some may be replaced
- (iv) Some may not need attention at all
- (v) The rest may be air-dried.

2.2 You will be issued record sheets and should record your decision for items involved.[12] It should be possible to track material being handled during the recovery phase. (Murphy's Law says that if you can't locate an item, someone will need it.)

2.3 Items to be frozen need to be loosely wrapped so that they will not freeze to the adjoining item, e.g.:



2.4 Pack freezer items in crate provided – spine down or, if packed flat, no more than 10cm deep – and add crate number to the record sheet. Pack items for air-drying on a trolley, while items for replacement or discard are put aside.

2.5 Take the trolley with you to Segment 3. Leave the crate behind; put other material in dumpster/bin.

3 Air drying segment

The first group will have items provided, while later teams should bring materials with them from the previous segment.

Resolve the questions raised on the instruction sheet before taking action.

Your aim here is to set up items so that they can be air-dried.

3.1 Set up area – spread plastic on floor and set up a fan. The plastic not only provides a clean surface but also keeps your drying lines in order.

3.2 Locate supplies – you will need paper towels (white or unbleached only) – each sheet should be about page size.

3.3 You will have items printed on coated paper (that is, the sort of paper on which illustrations are commonly printed) and items that are not. For items that are not you should place a sheet of paper towelling approximately every cm through the item; where the item consists entirely of coated paper or has adjoining coated pages, then a sheet of paper towelling should be placed next to *every* coated page. If this is not done, the item will block, and blocking cannot be reversed.

3.4 Stand the items on end with the open pages towards a fan.

3.5 Some material will not stand up unsupported.

You will have material which will not stand before a fan and in this segment you should investigate ways in which you can handle this kind of material. You will have pamphlets, periodical issues and files. You should investigate:

- * suspending items from fishing line;
- * building cardboard cradles to hold the material;
- * using record racks to support items;
- * spreading items on the floor with the fan turned towards the ceiling (in this case you will need to keep turning the pages as drying proceeds);
- * anything else which occurs to you.

What particular problems do you see arising with files?

3.6 At the end of the segment take your material with you to the next segment. Roll up the plastic and leave it and other materials for the next team.

4 Wind tunnels

Again, the first team will have material provided.

Resolve the questions raised on the instruction sheet before taking action.

Air-drying can be expedited by using wind tunnels. A wind tunnel is just what it says: a tunnel constructed over the items to be dried so that the stream of air from the fan can be concentrated over the items.

Wind tunnels can be constructed from many things, e.g., cardboard, plastic sheeting, and the tunnels can be constructed in many ways. With an eye to the materials available construct a wind tunnel and set up the material which you interleaved in the last segment.

At the end of this segment demolish your wind tunnel and put the items you have been handling in the dumpster.

5 Discussion

We will review the process. Further advice concerning freeze-drying and other procedures can be covered at this point.

Oral Briefing

Before entering the disaster site each team should be briefed, and advised:

- * that there is some structural uncertainty and that helmets must be worn;
- * that there is mould and face masks must be worn;
- * that there is some possible contamination and that gloves must be worn;
- * that there is no light and that torches must be used;
- * that there is a specific range of items which they are expected to retrieve and handle, e.g., an identified four shelves of material, and that of the identified materials there are some that should be considered valuable.[13]

A frequent problem is the tendency for some trainees to act without thinking. No matter how much the trainer emphasises the need to think about what they are doing *before* they do it, inevitably someone will feel that action is better than thought and will dive in. One way to combat this is to supply a number of questions which they must resolve before beginning each segment.[14] These questions should be given to them as they commence the simulation. One such set of questions which the author has used is as follows.

**Disaster Simulation
Briefing Notes
Part 2**

Questions to be answered:

Each segment will begin with a discussion of the situation and the ways in which it should be addressed. Members should then apply the decision(s) which they have made. The team should choose a different team member to head each segment.

1 Salvage

Given situation:

This is a disaster area in which there is water on the floor and no power. It is dark. There may be mould and there may be protruding obstructions of various kinds. Teams have been advised of the material which they should retrieve and that it is to be taken to the evaluation area.

Questions for the team to answer:

- What problems may exist?*
- How should they be handled?*
- How to organise the teams?*

Then to move the material.

2 Evaluation, recording and packing

Given situation:

This material has come from the disaster site.

Questions for the team to answer:

What is the purpose of evaluation?

What should the extent or limit be on recording?

Why record?

Should the reason for discard be recorded? What might happen if this were not done?

This being done, how should you pack/transport/store materials? What problems do you see?

Organise the team: evaluator, recorder, packer, and handle the material.

3 Air-drying

Given situation:

Material for air-drying has been received. It is of varying size, thickness , etc.

Questions for the team to answer:

What different problems can be seen in handling the materials which you have: e.g., coated paper, not able to stand up, etc.?

How can they be handled? What can be used?

Given that interleaving paper will become saturated, how would you deal with this?

How to organise the team?

Organise the work flow and set up the procedure.

4 Building wind tunnels

Given situation:

Passage of air can be speeded up by channelling it through a tunnel.

Questions for the team to answer:

What materials, commonly available, might be used in the construction of a wind tunnel?

What materials available at this moment might be used?

How would you place the material in the tunnel?

Will material require support? If so, what might you do?

Build the tunnel.

5 All teams after the simulation

To collect all salvaged materials and place in the rubbish skips.

6 Review

- (a) What solutions did your team come up with? How well did they work?
- (b) General comments and distribution of evaluation sheets.

Each team is then given approximately thirty minutes for each segment.

The Salvage Segment

Helmets, gloves, face masks and torches should be available.[15]

The teams are advised that they are to retrieve a certain amount of material and are given a 'priority retrieval' listing. This might be all red covered books, all books less than a certain thickness or all books on coated paper. It might also involve files with a certain marking. The teams decide among themselves who will act as the leader, survey the site, identify the material to be retrieved and decide on their strategy. Although a supervising trainer will be available and will answer questions, it is best if the team can work out their own solutions. At 'Mission Mooroolbark' Jeavons Baillie added unexpected events during the salvage – the teams were advised that there was a sudden immediate

need for a particular item and they were required to locate it. One member of each team was also asked to start limping to see how long it took the team to recognise that someone was injured and then to see how they coped with this. By the end of this segment the team should have identified and removed materials, isolated priority items and be ready to move to the next segment in an orderly manner.

The Evaluation, Recording and Packing Segment

This segment will require: a table, a chair for the recorder, paper, pens, freezer paper, labels and markers, crates and trolleys.

The team should choose a leader and a recorder. The role of the team in this segment is to inspect the material which they have retrieved, decide upon appropriate treatment and pack the items which they have decided to freeze (and other items if the air-drying segment is at a distance from the disaster site) and record what they have done. If, as is most likely, a lot of material does not carry call or file numbers, the team will need to give thought to the most efficient way of recording these items.[16] As indicated earlier, the teams can be given pre-printed record sheets, but it is probably more valuable for each team to think about the purpose of an evaluation form and then devise its own. The teams must give thought to the reasons for discarding items and should consider the possible repercussions if such reasons are not documented and they are later required to justify their decisions.

At the end of this segment the team should have divided the items into: priority treatment (freezing or air-drying), material to be discarded or replaced and material for air-drying. The material to be discarded can be placed immediately in the dumpster, the material for freezing wrapped appropriately and packed in crates, and the rest taken to the air-drying segment. The area should be left clear for the next team.

The Treatment Segment

This segment will require: fans, paper towelling, fishing line, plastic sheeting, sheets of card, scissors, buckets, thin rubber or plastic gloves. Again, a team leader should be chosen.

Moving to the air-drying segment they may consider problems raised by the varying types of materials – loose sheets of paper, maps, pamphlets, substantial volumes, books with coated paper and non-paper media of various kinds. This segment can also include books which are

covered with mud and which may be washed. They should discuss the supplies available and how they might be used and go ahead with the recovery. They should explore the treatment of flimsy pamphlets which must be supported or hung on fishing line while drying. They might also consider the possibility of photocopying such items and avoiding the drying process altogether. The trainer should be available to answer questions and to comment if the team is going wildly astray, but, again, it is better if the team works out its own solutions.

It is useful for teams to see examples of burnt books; and Toby Murray says that she freezes items the night before so that trainees can see what a 'booksicle' looks like.[17] Another exercise of value is to demonstrate the cleaning of mud-covered books which, if held firmly, can be dunked in clean water or gently hosed without the water penetrating the book.

The Wind Tunnel

In addition to fans, this segment will require the provision of a supply of materials which might be used to construct a wind tunnel: plastic sheeting and chairs or other possible supports, large sheets of cardboard, adhesive paper tape, scissors, etc. They may also consider furniture already in the room. As part of the aim of this segment is to have the teams think about the construction of a wind tunnel, it is as well if the materials available are not flagged as possible wind tunnel components.

It is desirable if one team cannot see how the previous team has resolved problems. If the first team is creative, it is a pity if their solution is promptly adopted by subsequent teams.

Review

Once all teams have moved through the segments (and have helped clear up by dumping used items in the dumpsters), then the trainer should discuss the workshop with them. The aim of the review is not just to find out how the teams view their own performance and to answer any questions which they may have, but also to obtain their assessment of the workshop. An assessment form is useful here. The trainees should have the option of submitting the form anonymously as anonymity may ensure greater frankness. This is further discussed later in this chapter.

Where Is Training Available?

There are a number of sources. At least two universities teach such courses, external workshops are run and internal workshops are commercially available in some areas and are, in fact, not difficult for an institution to organise on its own.

University Courses

Training in disaster recovery can be taught as a segment of an academic course: as part of a course on conservation, as at the University of Canberra (previously Canberra College of Advanced Education), or as part of a librarianship course as at the Queensland University of Technology.

The Canberra course, organised by Dr Colin Pearson, commenced in 1978 and was the first exercise in disaster training run in Australia. The intention of the course is to train conservators in methods used in disaster recovery; it consists of a half-day theory followed by a practical session in which students are provided with materials which have been soaked and are required to decide appropriate treatment. A similar course is run in the university's Information and Archives course, although this segment does not include a practical session.

Disaster training at the Queensland University of Technology forms part of a preservation elective in the Library Science course. It consists of a presentation of videos dealing with disaster recovery followed by a half-day workshop handling wet and burnt materials. Recently this course has been conducted by the Preservation Branch of the State Library of Queensland. Tamara Lavencic has said:

By allowing students to handle a saturated or burned book or file, they learn its limitations and appreciate its physical fragility. The importance of drafting a written disaster strategy is also emphasised, as is the necessity of practising the plan by putting it into action.[18]

External Workshops

Any subscriber to the Internet may find information about disaster training workshops of many kinds on the ConsDistlist.[19] These are, for the most part, run in the United States and Canada but do include useful information in the notices posted. The archives of this list can be found at <http://palimpsest.stanford.edu/by-topic/disasters>. Reports of workshops

which have been run are often included in *CAN* (*Conservation Administration News*).

Workshops Available within Australia and New Zealand

In Australia training sessions have been run by Conservation Access at the State Library of New South Wales, by CAVAL in Victoria, by conservators in Queensland and by Artlab in South Australia as well as by Kim Morris at the National Library. In New Zealand, as noted earlier, Tony Clarke of MONZ has been running training workshops for many years.

Conservation Access programs have been led by Alan Howell and by Tamara Lavrencic (who was previously involved with similar sessions in Queensland, including that at the Queensland University of Technology). A typical session, run in 1990, drew twenty delegates from fourteen libraries.

All aspects of minimising the untimely destruction of books, manuscripts, audiovisual and magnetic media were covered, and participants learnt the essential elements of disaster prevention, including, importantly, how to develop the various components of a model disaster plan to meet the needs of their own library.

To encourage lively discussion and input at the section of the workshop entitled 'How to write a disaster plan: taking a model and tailoring it to your needs', Conservation Access requested that participants consider a variety of pertinent questions and bring the completed questionnaire with them to the workshop.

In addition to information on the management aspects of disaster planning, the participants received hands-on instruction in six disaster recovery techniques for paper-based items and audiovisual and magnetic media.[20]

Marion Roubos-Bennett, Manager, Conservation Access advises that they also prepare counter-disaster plans for clients. They then provide training on-site for managers, recovery team leaders and all staff if required. They run mock disasters and teach salvage procedures.

We have had wide experience delivering training over the last eight years, have written Plans for major organisations and set in place continued refresher courses. We have wide experience in undertaking salvage for organisations, so in that respect, do the real thing as opposed to mock-ups, and last but not least we keep well abreast of literature and videos.[21]

The first CAVAL workshop was held in 1988.[22] It was the brainchild of Max Borchardt, then Chairman of the CAVAL Disaster Management Group, and was led by Alan Howell. Entitled 'Lessons from Leningrad' (the fire at the Leningrad Academy of Sciences had occurred just twelve months before), it was held at Deakin University in Geelong, lasted four days and attracted forty-four librarians and conservators from around the country. Many of those attending went on to organise their own training programs. Further workshops were held at Ballarat in 1993 ('Ballarat Is Burning') and the most recent, 'Mission Mooroolbark', in 1995. These last two workshops were led by Jeavons Baillie from the State Library of Victoria and were compressed into two days. Institute-specific workshops were also held, in the early days by Max Borchardt and later by the author. As the author was involved with the CAVAL workshops, discussion here of training has been influenced by that model.

Disaster planning workshops in Queensland were organised by conservators from the State Library, the Queensland Museum, Queensland State Archives and the Queensland Branch of Australian Archives. The first workshops were coordinated by the Queensland Branch of Australian Archives in 1990 and held in Brisbane and Townsville. The programs offered vary according to time and space restrictions and are currently run by Grant Collins of the Preservation Branch of the State Library of Queensland.

In South Australia, Artlab has run training sessions for the staff of the North Terrace Precinct, that is the University, the Museum, the Art Gallery and Artlab itself. Each workshop was for nine to fifteen people and was from institutions with similar collections. The session consisted of a half-day session on theory and how to write a plan. In the afternoon they ran a practical session. They collected books and photographs and put them in water contaminated by oil. Initially this segment was given little structure, but they found that structures tended to develop as they went along. The sequence was: retrieve, evaluate, document, and consider how to treat different materials. These sessions also included discussion of how to treat textiles and objects. The trainees were given a five-minute introduction and told: do not rush, do not panic, think, remember health and safety, and consider the logic of the situation. Helen Halley of Artlab says that it was hard to get trainees to extrapolate from examples and to imagine a similar situation in their own institutions. It was also necessary to emphasise the need for documentation and the need to be practical in approaching the situation.

The first training in New Zealand and, except for Colin Pearson's course, the first training in Australasia was set up by Tony Clarke in Wellington. Some of his earlier experiences have been described in

Chapter 1. The sessions which he runs are for staff of particular museums or libraries, but they are open to other museum or library professionals in the area. When the workshop is held outside Wellington, he sends a guide to setting up a workshop which will tell them the sort of things they will need to acquire before he arrives. (SOLINET in the United States does something similar.) His workshops usually last for two days with the usual split of theory on the first day and practical experience on the second. The theory session includes contingency planning, fire safety and, possibly, earthquake preparedness and storage systems for museum collections. More specific workshops are also offered, e.g., dealing specifically with earthquakes (including one with an earthquake simulation), the importance of museum storage for the protection of collections in an emergency and writing a contingency plan. Recently, because of the difficulty of getting people together for two days running, he has held sessions where the theory is on one day and the practical session two to three weeks later. Tony Clarke has produced a video of his training sessions.[23]

Tony Clarke prefers a workshop of eight participants but notes that the usual number is from twenty to twenty-five. Eight participants would certainly avoid the problems which larger numbers provide for the forming of simulation teams. CAVAL, however, prefers the workshop to contain around thirty people, as fewer may not be financially viable, while more may make the workshop unwieldy. In this case those attending will be formed into a maximum of four teams for the disaster simulation, and seven people results in a reasonable team size.

Internal Training Sessions

If a training session is run for an institution which has never experienced a disaster, it is highly likely that many staff attending will be unconvinced of the need for training, or even for a disaster plan – if it has never happened, then there is a belief that it never will happen. At worst, attitudes of these staff may range from apathetic to unconvinced to hostile. It is desirable, then, if the trainer can alert them, right at the beginning, to the possibility that *their* professional life might be adversely affected. The trainer may talk about disasters which have happened in similar organisations. Someone in a seventh floor office of a high rise building may be confident that she will not be affected by flood and that the roof is far enough above for them not to worry about leaking roofs. She may, however, think about malfunctioning sprinkler systems or electrical fires. Another may believe that his organisation does not hold valuable items and he may be asked to consider the implications of

interruption to service and the loss of records vital to his operations. Frequently, prior discussion with representatives from the institution can identify a known problem, a leak which always occurs after heavy rain, for instance, and this can be used as an example. The author has used hypothetical examples based on the institution concerned, e.g., 'A staff member reports that she has been to Storage in the Jackson Building, the lights will not go on and she believes that she can hear water dripping – what is the first thing you would do? The second?'

Once the likelihood of disaster and the need for a plan has been established, the content of the disaster plan can be covered, with an emphasis on the need to examine the operations of the institution involved. This may be reinforced by the further use of hypothetical questions. Some overseas training courses have provided conference trainees with questionnaires concerning the building in which the workshop is run and have sent the trainees to examine the building and answer the questions. Other matters which should be covered include: a discussion of insurance and the availability of emergency funding, the management of staff involved in disaster recovery, including a recognition of stress experienced by these workers. The availability and extent of assistance by commercial disaster recovery companies may also be covered.

How Useful Is the Training?

A workshop is only as useful as its outcome. Some measure of the success of a workshop can be gained anecdotally; the knowledge that trainees have returned to their home institutions and set up disaster recovery plans, the knowledge that trainees have based their own workshops upon what they have learnt, or the knowledge that a disaster was handled using techniques taught at the workshop. Most workshops, no matter what the topic covered, try to get some feedback from those attending. A fairly standard technique is to issue an evaluation sheet for the trainees to complete at the end of the session. A multiple choice evaluation sheet makes it easy to respond but may not provide the response which the trainee wishes to make. The choices may be too black and white, or the trainee may have an angle which the workshop is not expecting. Some trainees are ready and willing to take the time to write out their criticisms, others are ready to depart and respond in a quite perfunctory manner. The CAVAL workshop 'Ballarat Is Burning' provides an interesting contrast. The usual multiple choice evaluation sheet was issued at the workshop,

while, some weeks later, Sheena Cuthbert and the author contacted most of those who had attended and sought further information.

The evaluation sheet was designed for easy response and sought feedback on:

- 1 workshop: publicity, accommodation, organisation;
- 2 individual sessions: disasters, disaster plans, disaster bins, fire handling, disaster prevention, disaster simulation (divided into: salvage, sorting, packing, interleaving, air-drying and recording);
- 3 anything not covered?
- 4 anything which could have been omitted, shortened or handled differently.

The response to each topic was graded from 5 to 1: excellent, good, average, not so good, poor.

Thirty-six attended the workshop; of these, eighteen completed evaluation forms with fourteen adding comments to their gradings. Generally speaking the response was positive with no aspects graded as 'poor' and most falling in the 'good' to 'excellent' rating. Some programming was questioned, the Fire Brigade demonstration received top rating,[24] and the segment on prevention and insurance which followed it suffered by comparison. Individual comments concerned the need for: more information on the preparation of a disaster plan, longer time in the simulation, information on mould, and for the briefing notes to be distributed beforehand.

These are all short-term responses and, although gratifying, give no indication of the long-term value of the workshop. Such evaluation sheets may show an enthusiasm which is not carried forward into practice or, indeed, an initial apathy which does not last. Approximately four weeks after the workshop Sheena Cuthbert, who had attended the workshop, suggested that a follow-up would be valuable and, together with the author, telephoned the majority of those who had attended the workshop and asked two questions:[25]

- 1 Looking back at the workshop, what was the main impression/value which they had taken away with them?
- 2 How did they expect to use the knowledge which they had gained?

The response was encouraging, and those contacted talked freely and constructively. Many felt that the task of disaster recovery was overwhelming and commented:

The hugeness of the task is daunting.
It is far too late once it has already happened.
Importance of being prepared.
Heightened awareness of the need to take action.
Plans need to be drawn up well in advance.

Others felt that they had been alerted to matters which they had not previously considered.

I am now thinking in a different frame of mind.
Most impact in realising what you would be facing.
Awareness of a completely new field.
Emphasised how much I was unaware of.
How lucky we have been up to now that no major disaster has occurred.[26]

The comments on the simulation included one comment which other trainers may wish to consider:

One interesting comment concerned the different approaches by men and women in the retrieval of material from the disaster area. Males, it was suggested, had tended to start moving material out immediately whereas females wanted to assess the situation and to plan before moving. Indeed, comments made on the day suggested that males immediately assumed the role of leadership – to the surprise and irritation of the females. Perhaps gender bias is something which should be considered when developing a disaster plan?[27]

When it came to the second question:

Where the workshop members are in a position to take action then they appear to be doing so. A number indicated that they would order both CAVAL's disaster plan on disk and one or more disaster bins. A number were already at work on a disaster plan or were actively raising awareness among staff. Two planned to run simulated disasters in their home institutions and another wanted CAVAL to organise a similar exercise for a professional

organisation. A few institutions already had disaster plans and were organising (or had organised) training sessions. A number were writing reports to senior management and urging the development of disaster plans. Some spoke of 'senior management' as an apparently remote body and appeared pessimistic that much would come of their report. If these workshop members are correct in their belief then this raises a question – why would an institution pay to send a staff member to such a workshop if management was not prepared to consider the outcome?[28]

So, on the whole, it does not appear to have been a workshop where those attending went away and forgot about it – although the long-term benefits will be hard to assess. The workshop appears to have been valuable, and, in the course of preparing this book, the author came across some Disaster Controllers who received their first training at Ballarat.[29] As we spoke to most of those who had attended the workshop, we were able to get a wider response than was available via the evaluation sheets, and those to whom we spoke had the opportunity to make considered responses and to discuss their points of view. Incidentally, the Ballarat follow-up was deliberately done by telephone as even the best intentioned people may not get around to replying to a written enquiry (even when accompanied by a stamped, addressed envelope). It was a time consuming and expensive exercise and may not be possible as a regular practice, but it does give some indication of the potential value of a workshop. If it is possible to follow up external workshops, then it should be done.

Internal workshops should be run on at least an annual basis. Staff leave and those who remain have daily priorities other than disaster recovery. The procedures are likely to become a faint memory if they are not reinforced on a regular basis.[30]

Scenario 12. A Cautionary Tale (without a solution)

Faculty members are starting to get very irate. The disaster is past, the building has been refurbished and everything is back in place. As far as can be seen the library is back to normal and everything is working as it did before. The trouble is that the new materials which they are ordering are taking a very long time to get through and some of them are needed urgently. At the time of the disaster staff were called away from ordering and cataloguing to help with the recovery and later had to remove lost material from the records and order and process replacements. For much of this time they were also operating in temporary quarters. This has meant that a big backlog has built up. They can see the extent of the backlog and the constant stream of complaint is only adding to the pressure.

Remember: The disaster is not over when the physical signs have been tidied away. It will echo for a long time afterward.

Notes

- 1 Randall Butler, 'Disaster Planning in Nevada.' *Conservation Administration News* 48 (January 1992): 4.
- 2 Randy Silverman, Email to author, 7 September 1994.
- 3 *Ibid.*
- 4 'Planning for Disaster a Success.' *National Library of Australia Gateways* 8 (March 1994): 6.
- 5 Gregor Trinkaus-Randall, Email to author, 15 September 1994.
- 6 Disaster recovery videos are available and some are listed in the bibliography.
- 7 Loraine Olley, (10 January 1994) 'Course on Disaster Preparedness', ConsDistlist (Listserv) available E-mail: Listserv@lindy.stanford.edu
- 8 See Randall Butler, 'The Inland Empire Libraries Disaster Response Network.' *Conservation Administration News* 34 (July 1988): 8/9. Another account of an earthquake preparedness workshop can be found in Gretchen Karl, 'LAPNet 2: Earthquake Preparedness Workshop.' *Conservation Administration News* 42 (July 1990): 12-13.
- 9 Silverman, *op. cit.*

- 10 Marilyn Crane and Sheryl Davis, 'The Practice of Disaster Response.' *Conservation Administration News* 55 (October 1993): 8.
- 11 John F. Dean, Email to author, 6 September 1994.
- 12 An alternative is *not* to issue ready-made record sheets but to ask the teams to decide what information should be recorded and to design the sheets themselves.
- 13 This can be quite arbitrary; all red books/all books on coated paper.
- 14 Regardless of the stress which the trainer has placed upon thought before action, there will *always* be some who will dive in precipitantly. The trainer can but try.
- 15 If helmets fitted with torches are available, they are to be preferred.
- 16 Material collected for a disaster workshop is likely to include a lot of items which a library has decided not to add to its collection, unwanted donations, duplicate periodicals, etc.
- 17 Toby Murray, Email to author, 22 November 1994.
- 18 Michael Bausch, 'Preservation in Queensland: Working for a Common Cause.' *National Library of Australia News* 4, 8 (May 1994): 13.
- 19 Subscribe through: listserv@lindy.stanford.edu
- 20 Marion Roubos-Bennett, 'Library Disaster Preparedness Workshop.' *InCite* 11, 2 (13 August 1990): 134.
- 21 Marion Roubos-Bennett, Letter to author, 23 May 1996.
- 22 Cathie Jilovsky, 'CAVAL: A Cooperative Approach to Library Disaster Management,' in *Redefining Disasters: A Decade of Counter-disaster Planning* (Sydney, October 1995), pp. 69-90.
- 23 O.A. (Tony) Clarke, *An Introduction to Emergency Preparedness* (Museum of New Zealand, 1993).
- 24 Is it a cause for worry that librarians seem to like setting fire to books?
- 25 An exact figure is no longer available; memory suggests that it was about thirty of the thirty-six who attended the workshop.
- 26 Sheena Cuthbert and Judith Doig, 'Disaster Plans: Who Needs Them?' *AARL* 25, 1 (March 1994): 15.
- 27 *Ibid.*, p. 16.
- 28 *Ibid.*
- 29 Other Disaster Controllers had had their first training at 'Lessons from Leningrad'.
- 30 The author recalls updating a disaster plan and, when seeking to replace some pages in copies of the plan, having a member of the recovery team say, hopefully, 'It's in a blue cover, isn't it?' It was, which was at least a step in the right direction.

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General Resources on the Internet

ConsDistList. Subscribe through: listserv@lindy.stanford.edu
COoL: Conservation on Line <http://www.stanford.edu>
Leeke, John. 'Historic Homeworks.'
<http://members.aol.com/johnleeke/private/pages/hhw-home.htm>

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