Disaster Control Planning

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A disaster, as far as the library world is concerned, has been defined as "an event which is wholly unexpected and damages, or seriously threatens to damage, the collections of an institution".

It would be nice to be able to say that disasters are not man-made and only result from natural phenomena but sadly this is not the case and all too frequently they are generated by the deliberations or the carelessness of man. A disaster can result from an act of vandalism, it could be fire resulting from arson, negligence or poor maintenance. In some regions of the world there is a serious threat from an earthquake or extreme weather conditions such as hurricanes or tornadoes. It can be, and more frequently is, the result of a burst water main or pipe. Whatever the cause, water usually becomes involved, often on a massive scale from burst water pipes or fire hoses. This associated and potentially damaging threat is an additional hazard, perhaps more worrying as librarians are faced with a race against time in order to prevent further degradation and damage.

Many examples of disasters can be cited. The most famous was the Florence experience in 1966 when the waters of the Arno affected so much of Italy's treasures, but there have been many others, notably the 1972 fire in the Law Library at Temple University, Philadelphia and the Stanford University, Meyer Library, flood in 1978. More recently the Los Angeles Central Library burned for nearly eight hours in April 1986 and over 1 million books were destroyed or damaged; a further million suffered smoke damage. Nearer home the Newtown Public Library was destroyed by fire in 1986.

All of these disasters arose from different incidents but have in common the devastating effect on the library collections. Disaster is a strong word, bringing to mind a catastrophic occurrence of great proportions but it should be remembered that an event does not have to be of any significant size for it to be disastrous in a library. A small event happening in the wrong place at the wrong time can be as potentially damaging as a large one. The use of the word 'disaster' to describe such events, whatever their size, is a careful and deliberate choice.

If we accept the reality of the "disaster threat", what can a library do to protect its holdings from what may seem at times to be a daunting problem? In fact a great deal can be done both to prevent and control disasters. "Disaster Control Planning" is the term used to describe the countermeasures which can be on a large or small scale according to the needs, ability, or financial resources of a library. You should not be deterred by an inability to compile a complex plan; there are cases of the most basic plans being successful and any plan is better than no plan. Equally you should not be complacent and think it won't happen to you; disasters strike in the most unlikely places at the most unlikely times. Statistics suggest a library can expect to experience a disaster of some sort in a ten year span.

It would be foolish and naive to think that we can prevent disasters as we cannot. We can, however, do a great deal to prevent some of them happening, to reduce their effect on the collections when they do happen and to minimise the damage caused to those items which become affected. To do this it is necessary to apply preventive measures, to establish emergency procedures, hold emergency equipment and supplies in readiness, arrange for the necessary back-up services to be available and for staff and disaster teams to be fully conversant with, and trained in, disaster reaction. In short, a "Disaster Control Plan".
The value in having a disaster control plan is in having the ability to react to an incident swiftly and efficiently. Whenever water is involved there is usually a need to react with the objective of salvaging and stabilizing the condition of material within 48 hours. This is the time span after which it is generally agreed that further and serious degradation to organic material takes place.

A Disaster Contingency Plan

A contingency plan should have four main elements:

1. Prevention
2. Preparedness
3. Reaction
4. Recovery

It is important when forming a plan to remember the objectives. These are,

1. To prevent the event occurring
2. To protect material should the event occur
3. To salvage damaged material with sufficient speed and efficiency so that its condition can be stabilized.

Remember also to avoid a complex plan. If it is applied it will be under emergency conditions and therefore needs a degree of flexibility and simplicity to be workable.

Prevention

Prevention perhaps begins with the security of the building. Since a surprisingly high number of incidents and the resulting damage arises from break-ins involving arson and pure vandalism it is important to make the building as secure as possible. This involves security surveillance systems and alarms or a physical presence, such as security guards, or better still a combination of all these.

Identifying threats

1. Identify and be aware of local threats from outside the building, e.g.
   - tremors
   - flood
   - explosion
   - impact

2. Identify and be aware of threats from inside the building, e.g.
   - water tanks
   - water pipes
   - fire suppression systems (water)
   - air conditioning plant
   - washrooms
   - kitchens
   - laboratories and workshops

3. Identify and be aware of fire hazards inside the building, e.g.
   - electrical circuits
   - inflammable liquids
   - inflammable materials
   - accumulated rubbish

4. Identify and be aware of weakness, either by design or fault, in the building structure that may constitute a threat, e.g.
   - skylights
   - windows
   - basements
   - doors
   - gutters
   - drainpipes
   - drains
   - roofs
   - weak building fabrics

Reduce the fire risk.

Contact should be made and liaison established with the local fire services. Regular discussions will reduce the fire risk and help everyone involved to understand the problems and special requirements of responding to an alarm.

Buildings should have the means of raising the alarm in the case of fire preferably by an automatic fire detection system triggered by either smoke or heat detectors.

Providing a primary fire extinguishing system.

There should be an adequate number of the correct type of hand-held fire extinguishers. For a library, these are carbon dioxide or halon; all other types are damaging to library materials. An automatic halon flooding system is even better but the expense of these systems usually means they are confined to areas of special collections.

I would generally condemn sprinkler systems. An ability to detect a fire quickly and raise the alarm, compartmentalizing of buildings and a swift response from fire services makes them an unnecessary risk. The exception may be outlying libraries where a response from the fire service may be slow.

Flood or water ingress is the most common cause of damage to library materials, much of which is avoidable through improved building design and maintenance. Potential flooding hazards such as heating systems, water tanks and pipes should be identified and properly maintained. External flood hazards such as gutters and roofs should also be examined regularly and maintained in good order. If re-design and alteration can reduce or remove any of these hazards then this should be done.
Consider installing water alarms to detect the early presence of water. This type of alarm can be installed but the location of it remains a problem. A flow meter operating a shut-down valve perhaps offers a better solution in some cases.

Storage systems correctly designed and located can reduce the hazard. Water entering an area is usually rising or falling so shelf hoods and a bottom shelf at least 6" from the floor give a measure of protection.

Emergency Reaction

Having taken reasonable precautions to prevent an event happening we must accept that this protection is not total and that the risk although reduced, is still there. The capability to react must therefore be provided.

A detailed reaction plan should be drawn up detailing procedures to be followed, identifying areas of special concern and personnel, the location of supplies, equipment and local support services.

The formation of disaster reaction teams is necessary and should be drawn from library staff who are prepared to respond in this way. Some training and familiarisation with what they may be asked to face is particularly valuable. It should be remembered that special qualities are required from team members. They should be calm, able-bodied, manually dextrous and willing to work to strict guidelines.

In any response, teams should be under the direction of a senior person fully informed in disaster reaction. A clearly defined line of command must be established and adhered to, to avoid chaos and disorder.

Equipment readily at hand for use in an emergency is essential and will usually include:
- Electric water pumps (submersible)
- Electric water pumps (non-submersible)
- Hand operated water pumps
- Sufficient piping to link pumps to a "safe" area
- Wet vacuums
- Dehumidifiers
- Cold air fans
- Plastic crates
- Metal trolleys
- Lighting systems

Supplies of various items for use in an emergency should also be held including:
- Protective clothing (safety helmets, waterproof clothing, wellingtons)
- Polythene sheets (cut to size of storage shelving)
- Polythene on the roll

Mops and buckets
- Sponges
- Plastic bags
- Clean newsprint
- Blotting paper
- Cotton tape
- Scissors
- Bulldog clips (for holding plastic sheets in place)
- String
- Clipboards
- Notepads

Disaster supplies and equipment should be clearly marked as such with instructions that they must not be used for any other purpose and they should be strategically located.

Pack supplies rather than equipment in suitable containers and in the order it is likely to be used. A large plastic container on wheels is useful for getting what is needed to a site quickly.

However large and comprehensive a stock of emergency equipment and supplies may be it should always be assumed to be insufficient in a large scale emergency. It is therefore essential to have back-up supplies arranged and available.

Further equipment and services are likely to be needed so a list of local services should be held. Specialized services that may be required will include:
- Blast freezing and cold storage
- Transport
- Microfilm processing laboratory
- Plastic crates

In a large scale emergency, reaction will of course depend on the skills and resources available, but should always be orderly, organised, and carried out by teams fully briefed in the situation they are facing. To achieve this the following procedures are recommended.

1. The situation is assessed by the person in charge of operations.
2. When safe to do so the disaster area is entered to assess damage.
3. If possible, protection is given to undamaged material.
4. Teams are gathered and support services alerted.
5. Salvage plans formulated.
6. Salvage teams briefed.
7. Entry of damage area for salvage.

It is worth spending time to assess the damage and situation and brief teams. Time so spent will more than be saved by the orderly and informed approach that should follow.
DISASTER REACTION FLOW CHART

Building threatened or affected by emergency
  Emergency services called (if needed)

Buildings Officer called
Disaster Reaction Coordinator called

Situation assessed

Action to stabilize situation and control emergency
If stock is threatened or affected
determine likely needs and support services

Disaster teams called
Curators of affected areas called

Call professional conservation advice or assistance if needed

Teams organized

Necessary support services informed

Disaster boxes moved to crisis area

Disaster boxes opened

Undamaged stock protected

Damaged stock identified and sorted

For air-drying
  Listed
  Sorted
  Uncoated paper
  Interleaved
  Air-dried

For freezing
  Listed
  Packed in crates
  Transferred to blast-freezer/coldstore
  Freeze-dried

For specialist processing
  Listed
  Transport
  Dried

Sorted to identify those in need of restoration

To conservators
To safe area before shelving
Restoration of damaged area
Temperature and RH checked
The environment of a disaster area needs to be monitored closely. Most disasters involve water and care must be taken to keep the relative humidity as low as possible. This may demand the use of dehumidifiers; it will certainly mean good ventilation.

In the case of paper-based material salvage should begin by identifying and separating material which can be air dried from that which needs to be frozen. This must be determined by the type of material and degree of saturation. Remembering that there is a limited amount of time, the size of the emergency will be a controlling factor. If there is any doubt it should be frozen.

When forming plans and training staff it should be remembered that libraries usually consist of an assembly of different materials which will need to be recognised and dealt with appropriately in any salvage operation. While most material will be paper-based, the chances of having to salvage vellum, parchment, leather, photographs, glass plate negatives, fabrics, magnetic tapes and discs, etc. is high. Some of these are more susceptible to water damage than others and demand different solutions.

Material to be frozen should be placed in plastic bags and packed in boxes or crates in a way that each item is supported and prevented from being distorted. The way material is frozen will control its final condition. Blast freezing is recommended because the ice crystals formed are smaller than those formed in slower freezing methods and there is therefore, less risk of damage to paper, leather, parchment, etc.

That which can be air dried should be transported to a designated area to be dealt with by teams at that location. Books should be stood upright and apart with pages slightly fanned and as much air circulation as possible provided.

The preferred method of drying frozen library material is now freeze-drying or vacuum drying as this minimizes distortion and damage. Both however depend on specialized skills and equipment using a vacuum chamber. Vacuum drying is carried out at temperatures above freezing and draws off water vapour from the water. Freeze-drying is done at sub-zero temperatures by using sublimation, that is turning ice into water vapour without going through the water stage. This is the preferred method with obvious benefits such as protecting water soluble inks.

Whatever method of drying is chosen, once material is frozen there is no urgency as far as the safety of the material is concerned. The freezing stage is a stabilizing one where time is bought and breathing space is gained. This is very important because of the need to avoid making hasty and bad decisions about a collection which is likely to be an assembly of a variety of materials and complex structures.

Recovery from disaster will demand a return of the affected storage area to a safe and stable condition before material can be returned. Great care must be applied as water can penetrate deep into the fabric of a building and may be present for a long time if steps are not taken to remove it.

Finally an assessment of performance and of the plan will ensure that lessons are learnt from the experience and any weaknesses identified.

What I have pointed to is the formation of contingency plans which should help a library to protect its holdings. A properly formed disaster control plan will carry much more detail than I have had time to present to you today, but what you have heard is a case for the need and an outline of the important elements.

We have today the benefit of being able to learn from the experiences of several unfortunate institutions who have suffered events such as fire or flood. In nearly all cases the institutions had no disaster control plans and had to react totally unprepared. That they did so, often with skill and determination, is a credit to the individuals concerned but with contingency plans their success would have almost certainly been much greater and the damage less.