

Flood incident at the National Library of Scotland

Disaster control is a necessary component of any preservation policy and strategy. The National Library of Scotland (NLS) recognises the need to plan to prevent disasters by eliminating or reducing risk and to provide a capability to react to any remaining risk through the formation of contingency plans. The objective is to defend and protect the Library's collections and that part of Scotland's written heritage which they represent.

Introduction

Disaster incidents continue to be suffered by libraries and archives confirming the need to have preventive policies and countermeasures in place. Whatever the incident, water usually becomes involved and the Library must be aware of this type of threat and the need to react to it swiftly if it is to minimise damage to the collections.

That risk became a reality on 26th February 2009 when a main sprinkler pipe was broken and a large amount of water was released and cascaded through the main building on George IV Bridge in Edinburgh. This article will outline the reaction and measures taken dealing with an incident which affected the collections and the building fabric.

Background to incident

At approximately 1800 hours on the evening of 26th February 2009, print room staff working in level 12 of George IV Bridge at the National Library of Scotland in Edinburgh noticed a small water leak emanating from a main pipe serving the sprinkler system in the level 12 print room. A bucket was placed under the leak and adjacent equipment covered with polythene whilst the Security Unit was alerted. Shortly thereafter the print room supervisor attended the security control room to report that the leak was becoming worse and a member of the Security Unit went to the print room to assess the extent of the problem. On establishing the extent of the leak, he returned to the control room to contact the Estates Building Services Officer for advice. Whilst he was in the process of doing this, the pipe fractured, cascading pressurised water into the print room and triggering the sprinkler alarm system. The water from the 4 inch fractured pipe flowed out under pressure; at 3,000 litres per minute for approximately 6 to 8 minutes, which meant that approximately 25,000 litres infiltrated the floors of the building. This occurred at 1810 hours. Security returned to the print room and isolated the sprinkler zone, shutting the water off.

The Emergency Evacuation Plan was instigated; all members of the public and staff not involved in essential recovery duties were moved to the evacuation point on Parliament Square by 1815 hours. It is estimated that around 60 members of the public and 30 members of staff were in the building at the time of the incident.

Lothian and Borders Fire and Rescue were on site by 1820 hours and very quickly authorised a controlled re-entry to the building. Staff, with some direction from Security, attended the stack floors taking action to cover or move material, and assisting the fire services in moving water out of the building. Meanwhile Front of House and Enquiries and Reference Services staff organised a controlled access for members of the public to retrieve their belongings. The building was cleared by 1930 hours.

Initial response

The problem with the pipe joint was first identified as a small leak. The response of the print room staff was to place a bucket under the leak, cover adjacent equipment and report the matter to Security. The leak deteriorated quickly and this was further reported to Security prior to a member of the Security Unit attending. On seeing the extent of the problem the Security guard returned to the control room to contact Estates for advice. The pipe fractured whilst this was in process. The time lapse from the leak being spotted to the joint fracturing was in the region of 10–15 minutes.

A fully charged sprinkler system is essential for protecting the collections against fire. Closure of any part of the system can compromise that protection and must only be done under controlled conditions. However, in the event of a leak the immediate risk to the collections is water, and action to isolate the zone should be taken in the shortest possible time. Ideally, staff working in buildings protected by sprinkler systems should be aware of the location of the zone valve for the area in which they work and be able to carry out the simple close-down procedure prior to notifying Security of the identified problem. Where this cannot or does not happen, Security staff attending a reported incident involving sprinkler water release must be able to close zones immediately. The valves are electronically monitored in the Security control room, eliminating any risk of unnotified closures compromising fire security.

Whilst training all staff in operating zone close-downs can be done, we cannot rely on the availability of general staff in the event of a system leak incident. Despite our recent experience, such events are few and far between, and there can be no guarantee that staff coming across an unfamiliar experience will act in the manner expected.

However, it is clear that the risk of system failure is significantly increased when building works are being undertaken and this risk can be reduced by ensuring that staff working in affected areas are given specific guidance on how to act in the event of any form of leak.

Disaster Recovery Plan

Control procedures

As soon as it was known that there was a flood incident the Security staff invoked the appropriate elements of the Business Continuity Plan (BCP). This involved initial contact with key personnel, setting up central control and communications, assessing the situation and calling out the Preservation Manager, Estates Manager and coordinating the required efforts.

The primary requirement is for preservation and Estates personnel to attend. These individuals then determine whether or not the disaster recovery team needs to be called out. A central control area was set up, with one individual acting as the incident controller; the Preservation Manager then assessed the impact on collections and determined a plan of action and called out the necessary disaster volunteers. As volunteer team members arrived they were logged in and assigned duties, accessing material and equipment from the disaster recovery stores as required. The disaster recovery plan was instigated to include protection of collections and removal of flood water from the building. Collection material was protected using polythene sheeting and flood water was removed from the stack floor areas using wet vacuums. Material and equipment used are held in readiness in the disaster recovery store rooms. The Estates division safety person made an assessment of the building conditions.

Should it be necessary to move material, then the decision should be taken by senior preservation staff on the disaster recovery team. Although it seems counterintuitive, it is preferable to defer movement of collections until a preservation assessment has been made to determine what to move and where to. There is a window available of up to 48 hours before mould growth will start to affect water damaged material, so there is no real risk in allowing the time necessary for an appropriate assessment and displacement plan to be prepared. In some circumstances it might be decided not to call out disaster recovery staff during the night, but delay the operation until normal working hours.

The initial clear-up work ceased and most staff went home by around 0200 hours. Staff who were aware of the incident started to attend from 0630 hours, to resume the clear-up, and other staff began reporting for normal duty from 0700 hours. A management meeting was called at midday that established the current situation and confirmed the decision to remain closed to the public until Monday. This group subsequently met several times over the following week, providing the necessary continuity of decision-making for the ongoing recovery work.

Damage to collections

Some 4,000 books were affected by the flood and thousands of manuscript items were laid out to dry. What was important to record was the value of boxing collections. Books held in boxboard enclosures were largely unaffected by the flood water. Manuscripts held in solander boxes were slightly damp but the boxes took the brunt of the flood water.

The manuscripts (mounted in fascicles) were laid out to air-dry and did not suffer any damage whatsoever. A total of 516 items from the collections required remedial conservation treatment as the bindings (not boxed) suffered from direct contact with flood water.

Drying methods

We used several different methods to dry out the unboxed books affected by the flood, mainly interleaving, air-drying and wind tunnels. Material with coated paper was frozen and bagged and dealt with at a later stage. When the incident happened, it was just after 1800 hours on a Thursday evening. Early indications showed that many thousands of items were affected by the flood and a drying space was essential. A management decision was taken to close the library on Friday and over the weekend to allow the drying process to begin. Air-drying tables were set up in the main reading room and wind tunnels set up at our Preservation Services Unit based six miles west from the main George IV Bridge building in central Edinburgh. Books were fanned out and positioned on drying tables to allow free air movement to accelerate the drying process. To assist drying we set up oscillating fans directed toward the wet material held on the drying tables in the main reading room and wind tunnels at the Preservation Services Unit.

Main lessons learned:

- medical conditions of volunteer staff need to be known
- boxing of collections proved invaluable
- have the facility to cover bookshelves quickly in the event of an incident (see photo six sheet dispenser)
- protect collections in advance of building work
- staff and fire brigade tours of buildings
- not too many volunteers on site
- regular checks of disaster response supplies
- annual training on disaster response equipment
- Project Managers and contract staff – be firm with requirements when building work is taking place
- take locks off sprinkler zones

Conclusions

This was an avoidable event. Contract protocols were in place that should have eliminated the risk of any such failure. The fault causing the sprinkler pipe to fracture happened as a direct result of non-application of the protocols and the contracted company simply not following procedures.

Library staff put much time and effort into devising a comprehensive Business Continuity Plan (BCP) that is designed to provide guidance on how to deal with disaster situations. This real-life incident pre-empted the planned scenario exercise and so was effectively the first test of the plan and its value.

Whilst the disaster recovery plans within the BCP have been largely validated, the application was not fully successful. In the heat of the moment, activities went ahead and decisions were made without any reference to the plan itself. The key to this is the establishment of the incident controller, on which the rest of the coordination of the response is dependent.

This article is a short version of the author's record on the disaster (available on request at the editorial office).

Cet article est une version raccourcie du rapport de sinistre établi par l'auteur (disponible auprès de la rédaction).

Dieser Artikel ist eine Kurzversion des Berichts, den der Autor über das Schadenereignis verfasst hat (bei der Redaktion erhältlich).



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Scotland**