

## Chapter 8

# RECOVERY AND RESUMPTION OF OPERATIONS

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Records and information disaster recovery can be as simple as responding to the loss of data due to an equipment malfunction or as complex as records salvage following a hurricane. For community-wide disasters, no recovery procedures can begin until the emergency situation has stabilized. Earthquakes and hurricanes destroy much of a community's infrastructure—roads, telephone service, water distribution systems, electric power lines, and gas lines. Some locations may be physically inaccessible for days or weeks, adding considerable time to the recovery of critical information and prolonging the exposure of records and information to damaging elements.

Disaster recovery for records and information includes the following five steps:

1. Assess damage.
2. Stabilize the situation.
3. Begin salvage operations.
4. Begin restoration procedures.
5. Resume operations.

### ASSESS DAMAGE

The initial damage assessment (IDA) following an emergency or disaster is usually a basic estimate of the overall damage. It generally concentrates on major facility damage such as possible structural damage, facility loss, and blocked access. Complete records and information damage assessment cannot begin until access to records holding areas is allowed.

Cost is a big factor in damage assessments. An organization may not have the funds to attempt recovery of all records and information damaged by the disaster event. Records and information recovery is established by the vital records program during the prevention phase and included in the emergency management plan to speed recovery efforts. Recovery priority is given to designated vital records.

Records and information priority recovery material includes:

- Records listed on the Vital Records Schedule;
- Additional records and information included on divisional or departmental priorities lists;
- Records that are used to locate records and information such as indexes, file classification lists, accession analyses, location registers, and inventories;
- Records with high intrinsic value such as items for which a photocopy or microform would not provide a suitable replacement—original deeds, contracts, wills, and certain archival holdings;
- Items that have already developed mold;
- Items printed on parchment or vellum or printed on coated paper;
- Items with water-soluble inks such as maps, drawings, or manuscripts.<sup>1</sup>

If a records and information recovery service is under contract, the vendor must be contacted as soon as the emergency or disaster occurs or is noticed. In some natural disaster situations, recovery services will send recovery and response teams into the probable strike area. Recovery service representatives usually conduct some form of damage assessment on arrival, but the initial assessment must take place as quickly as possible and is the responsibility of the organization.

Damage assessment includes several factors. Obviously some appraisal of records and information physical condition is necessary. Determine quickly whether any records or information has been completely destroyed or is inaccessible. During the Alfred P. Murrah Federal Building bomb explosion in Oklahoma City, many records were buried under collapsed floors of the building. Not only were they immediately irretrievable, they also were never recovered before the building was demolished.

A sample records and information damage assessment form is shown in Figure 8-1. Records and information damage assessment factors include:

- *Extent of damage.* Are areas of the facility collapsed or still under water? How much damage has occurred to the records or information?
- *Kind of damage.* Is the damage caused by fire, water, collapsed structure, chemical contamination, or system crash?
- *Location.* Is the damage localized, or has the entire facility been affected?
- *Media.* What media has been damaged?
- *Vital records.* What are the vital records classifications for the damaged records and information?
- *Scope of damage.* Has damage occurred to records housing or containers? Will help be needed to move the records to a safer location for recovery?
- *Recovery.* Can recovery be accomplished internally, or will recovery services be required?
- *Cost-benefit of recovery.* Is the damage to records too extensive to be worth the cost of recovery?<sup>2</sup>
- *Stabilization.* What stabilization techniques are necessary?
- *Personnel.* What personnel will be necessary for the recovery and restoration steps?

As the damage is assessed, document the nature and extent of the damage. Videotapes or photographs of the damage are important for insurance reports and to evaluate the effectiveness of the emergency management plan. Take necessary notes to complete any required reporting for FEMA or insurance purposes. Three records and information damage categories can be established during the assessment.

1. Destroyed or unsalvageable records and information.
2. Unharmed, retained records and information.
3. Damaged records and information requiring recovery techniques.<sup>3</sup>

## STABILIZE THE SITUATION

The disaster situation must be stabilized to safeguard personnel. Some stabilization should take place at the same time or before the assessment step. These stabilization activities include turning off gas or water leaks, turning off electricity, removing or pumping out standing water, establishing security, and reactivating alarm systems where possible.

Stabilizing the environment and removing records from the situation to prevent further damage to the records and information. The techniques required depend on the nature of the disaster and the media involved. Proven stabilization techniques for records and information include:

- Reduce the air temperature and humidity and increase air circulation in the damage area to prevent the growth of mold and mildew and to prevent further damage to microfilm or magnetic media.
- Remove debris where possible to prevent further crushing of records housing or magnetic or optical drives.
- Isolate items infected with mold, mildew, hazardous chemical residue, or insects. Isolate a PC or LAN drive that is infected with a virus to protect the rest of the electronic systems.
- Place water-damaged microfilm and magnetic media in clean, clear water, or rinse media and place in sealed plastic bags while still wet.
- Begin insect extermination procedures immediately on isolated infested records to prevent migration.

As the environment is stabilized, begin the removal and relocation of damaged materials. Recovery and salvage of damaged records and information usually take place at an alternative operating site or at a designated recovery site. The site may be located internally or in another facility. The recovery site should be set up with adequate supplies, equipment, and furniture for salvaging the records and information.

Some organizations contract with commercial recovery services that set up and maintain recovery sites. Commercial recovery services usually establish a local recovery site for large-scale disaster recovery. Small volumes of damaged records and information

<b>RECORDS AND INFORMATION DAMAGE ASSESSMENT REPORT</b>	
Facility	<u>Plant 1</u>
Location	<u>Adjacent to reservoir</u>
Name of person in charge at site	<u>Mr. E. Coordinator</u> Phone/Pager # <u>123-4567</u>
Directions to site	_____
Where and to whom to report	<u>Plant entrance, Mr. E. Coordinator</u>
Identification needed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Type of Damage:</b>	
<input type="checkbox"/> Fire	<input type="checkbox"/> Smoke <input checked="" type="checkbox"/> Water <input type="checkbox"/> Chemical <input type="checkbox"/> Insect <input type="checkbox"/> Other _____
Localized <input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No Entire facility: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Extent of damage	<input checked="" type="checkbox"/> Heavy <input type="checkbox"/> Moderate <input type="checkbox"/> Light
Description of damage	<u>All rooms flooded at least 4 feet deep; standing water 2 feet deep; bottom drawers of file cabinets under water; all electronic files, including diskettes, wet and muddy, all PCs water damaged</u>
Records and information damaged	<u>Paid invoices, billing files, purchase orders</u>
File housing damage	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Describe: <u>bottom drawers waterlogged, possible rust</u>
Container damage	<input type="checkbox"/> Yes <input type="checkbox"/> No Describe: _____
Enclosure damage	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Describe: <u>file folders very wet, diskettes wet and muddy, PC hard drives wet</u>
<input checked="" type="checkbox"/> Vital	<input checked="" type="checkbox"/> Confidential <input type="checkbox"/> Secure Security Code _____
Vital records classification	<input checked="" type="checkbox"/> V1 <input checked="" type="checkbox"/> V2 <input type="checkbox"/> V3
Media	<u>paper, diskettes, PC hard drive</u>
Stabilization techniques necessary	<u>packout wet paper for vacuum drying, remove in refrigerated truck, transfer PCs to mobile recovery unit, clean &amp; dry PC hard drives, restore programs &amp; files from backup tape/diskettes/CDs, dry environment, treat for mold &amp; mildew prevention, treat file cabinets with rust inhibitor</u>
<b>Damage Category:</b>	
<input type="checkbox"/> Unharmed	<input checked="" type="checkbox"/> Damaged – requires recovery <input type="checkbox"/> Destroyed/unsalvageable
<b>Recovery Recommendations:</b>	
<input checked="" type="checkbox"/> Recovery service	<input type="checkbox"/> Internal
<input type="checkbox"/> Recovery service pack and transport	<input checked="" type="checkbox"/> Internal pack and transport
Number of internal personnel required	<u>5</u>
Supplies needed	<u>cubic foot boxes, wax paper, plastic buckets of clean water, rubber gloves, hand truck</u>
Damage Report Completed By:	<u>Jane Doe</u> Date: <u>07/31/2001</u>
Records & Information Damage Assessment Report	Form REM3 Rev: January 4, 2001

Figure 8-1 Records and Information Damage Assessment Report

are usually transported to recovery service facilities. Microfilm recovery requires shipping or transporting the film to a recovery laboratory. Some information reconstruction, such as cleaning and restoring a computer hard disk, requires very specialized recovery techniques and must be transported to the specialized service location.

**Packout** includes the procedures and techniques used to pack and remove damaged materials from a disaster site. When using a commercial recovery service, the recovery team may still have the responsibility of packing the materials for removal. Some larger vendors offer packing as part of their recovery services.

Wet paper records must be packed in appropriate cartons for drying. If very small volumes of paper records are wet, they may be packed and removed for air-drying. Larger volumes of wet paper records require some method of vacuum drying. **Vacuum drying** is a method of drying water-soaked documents by placing them into a vacuum chamber, creating a vacuum, and introducing warm, dry air.<sup>4</sup> **Vacuum freeze drying** is a method of treating water-soaked documents by freezing to prevent further damage from water in its liquid state, and subsequent drying under high vacuum with the controlled application of heat, usually from heating coils installed in special shelving. The water, in the form of ice, sublimates directly from a solid state to a gaseous state.<sup>5</sup>

Wet paper records require careful handling or they can be further damaged. Records and bound volumes should be separated by wax paper or cardboard when boxed to prevent items from sticking together. File folders and bound volumes should be boxed spine down to prevent further buckling or tearing of the paper.

Use cubic foot size boxes with cut-out handles for easier handling. Paper should not be packed too tightly in the boxes. For successful vacuum drying, pack materials by size, with bound volumes and file folders standing upright. Label every box, and make sure every box has a lid. If file drawers are easy to remove, do not empty them; they can be dried intact.

Wet photographs, microfilm, audiotape, videotape, imaging media, and magnetic media should not be freeze-dried. Water-damaged microfilm and magnetic tape must be placed into fresh, clean water or rinsed in clear water, placed into sealed plastic bags while still wet, and kept in a cool tem-

perature until restored. Wet microfilm must be transported to the recovery lab within 48 hours. Magnetic tapes must be cleaned within two weeks and must not be dried with heat.

Magnetic media, other than tapes, exposed to dirty, contaminated or salt water must be rinsed in clean, fresh water and allowed to air-dry. They may also be gently dried with a lint-free cloth.

Charred or soot-damaged records media must also be carefully handled. Charred paper is especially brittle and can deteriorate with rough handling. Fire-damaged media other than paper is generally packed and transported to specialized recovery services. Insect-damaged records must be thoroughly fumigated before attempting to salvage the information.

Records and information contaminated by hazardous chemicals must not be handled by untrained personnel. This type of disaster requires specialized handling and removal techniques best performed by commercial recovery services.

Water-damaged electronic hardware, such as hard drives and PC towers, must not be turned on until they have been completely dried and inspected for corrosion potential. This process should be conducted by qualified professionals. Magnetic media must not be used until they have been examined for damage to the oxide layer, and the data have been transferred onto other media. Recovery of electronic data can have a 95 to 100 percent success rate if immediate corrective action is taken.

## **BEGIN SALVAGE OPERATIONS**

Salvage procedures for records and information should be included in the emergency management plan. The damage assessment helps determine which recovery procedures are needed to reconstruct the records and information. The procedures must be appropriate for the type of damage—water, smoke, computer virus, or extreme heat. They must also be appropriate for the media to be salvaged—electronic, paper, microfilm, magnetic, and optical. Salvage techniques to be aware of include:

- Vacuum drying wet paper records helps prevent the formation of mold or mildew and prevents swelling or warping of bound volumes. It also prevents further deterioration while recovery and restoration procedures are carried out. **Vacuum drying** involves vaporizing water at

above 32° F to remove all moisture from the records. **Vacuum freeze drying** involves vaporizing water at below 32° F to remove all moisture from the records.

- Fire-damaged records media must have soot and smoke deposits removed and odor neutralized. Charred or heat damaged records may have to be microfilmed or photocopied to retain the information, and the originals destroyed.
- Paper records damaged by roaches and silverfish can usually be cleaned and microfilmed to salvage the information. Paper records damaged by rodents or termites are usually unsalvageable.
- Information on records damaged or affected by hazardous chemicals must usually be transferred to another media, and the original records destroyed.

Document all unsalvageable records and information as they are discarded to protect the organiza-

tion in future litigation. Be sure to include all records and information known to be directly destroyed during the disaster.

## BEGIN RESTORATION PROCEDURES

As records and information are recovered, clean, accessible facilities and housing must be available. If severe structural damage occurred, then alternative operating sites must be ready for use. Damaged file housing, retrieval equipment, and computers must be repaired or replaced. Many disaster recovery services provide location restoration as part of their contract.

Floors, walls, ceilings, carpets, furniture, equipment, draperies or blinds, and records housing must be thoroughly cleaned and disinfected. All traces of moisture, soot, smoke damage, chemical residue, and odor must be removed. Alternative sites must be supplied with adequate furniture and equipment, and replacement computers must be



### DISASTER SNAPSHOT

Because of a fourth floor fire, soot, contaminated with asbestos and low-level polychlorinated biphenyls (PCBs), was distributed throughout the upper structure on floors five, six, and seven of the Arlington, VA, County Courthouse. Contents, data processing equipment, and HVAC systems were also found to be contaminated. Fire extinguishing efforts and broken water lines contributed to water damage in the basement and floors one, two, and three. Approximately 5,500 county record books, 5,600 cubic feet of files, and 6,000 microfilm cassettes were damaged by soot and water.

A commercial recovery service stabilized the building environment to allow reoccupancy of nonaffected areas, and designed site-specific engineering controls to isolate contaminated areas from occupied areas. To return the HVAC systems to use, recovery service technicians performed plumbing and electrical repairs in the contaminated areas. The recovery service HVAC restoration helped dry water damaged areas and controlled the spread of mold and mildew growth.

To expedite business recovery in the court systems and the business community, recovery of vital records

became a high priority. Under containment conditions, documents were decontaminated for asbestos and PCBs. The recovery service technicians further restored soot-covered and wet documents to remove discoloration, odor, and mold. Building recovery was a two-phase operation. Decontamination of contents and structure was followed by abatement of asbestos-containing fireproofing.

Prevention of mold and mildew in the water damaged areas of the lower floors was an immediate concern. Affected areas were isolated, wet carpet was removed prior to treatment with a fungicide, and the areas were then ventilated by air flowing through special filtration.

Cleaning the contents and structure contaminated by asbestos and soot was performed under full containment conditions and was cleaned for PCBs to a level of less than 1 ug/100 cm<sup>2</sup> and an asbestos clearance level of .01+ /cc. Controlled demolition and environmental remediation services, including profiling and disposing of all waste generated during the recovery process, followed. Neither the occupants nor the general public were exposed to any potentially hazardous materials during the four-month recovery process. The recovery service crews performed all phases of restoration without disrupting normal courthouse business.<sup>6</sup>

capable of supporting the existing electronic system requirements.

Restoring the work area may also include relabeling new file folders, microfilm cartridges, or data diskettes. Electronic imaging media or microfilm may have to be duplicated or reformatted. Paper records may have to be resorted and placed into correct filing order.

## RESUME OPERATIONS

After the crisis has been stabilized and recovery procedures are completed, activities must begin to return operations to normal. Resumption of operations activities include the following:

- cleaning and repairing or replacing the facility;
- cleaning and repairing or replacing furniture and equipment;
- restarting nonessential equipment, processes, and systems;
- resorting, organizing, and indexing salvaged records and information;
- reshelving or refiling salvaged records and information.

Environmental stabilization must be completed before moving back into the facility. Water, smoke, and insect damage must be repaired, carpeting replaced, structural damage repaired, and the environment returned to normal. Furniture, including file housing and equipment, must be repaired or replaced before records and information can be restored to the files. Nonessential equipment, processes, and systems that were shutdown prior to or during the emergency situation can be restarted as needed.

Records and information must be placed in retrievable order with current indexing before reshelving or refiling. Using photos and videotapes taken during the damage assessment stage can aid in restoring records and information to predisaster order and location.

Resumption activities begin while the organization is still operating from the alternative site, which is considered a temporary location. As soon as the facility environment is stabilized and repaired, operations can be moved back into the facility. In the case of total facility destruction, the alternative site is used only until a new location is established.

As normality returns to the organization, the disaster response and recovery activities need to be evaluated. Comparing the plan to the reality of the response and recovery process aids in closing loopholes and preventing the same mistakes in the future. The review procedure should include a follow-up with all personnel involved in salvage and recovery operations. Specific details and problems encountered during each step should be evaluated and appropriate changes made to the plan.

Additional training for response team members should be provided where necessary. Response and recovery supplies should be inventoried and immediately replaced. Performance of suppliers and recovery services should be evaluated and specifications updated where needed. Vendors that performed poorly may need to be replaced. Affected records and information and restored areas must be monitored regularly for any sign of continuing problems, and steps must be taken immediately to prevent further spread of the damage.

## FINAL OBSERVATIONS

*Emergency Management for Records & Information Programs* has presented a general blueprint for developing an organization-wide records and information emergency management plan. It is intended as a universal guide to the basic concepts, systematic steps, key elements, program benefits, and practical considerations in preparing, implementing, and updating such a plan. A written, approved emergency management plan is not a substitute for the good sense, sound management, and creativity that are required when responding to an emergency or disaster.

Many elements of an emergency management plan are already in place before the decision to establish a formal plan is made. Insurance programs, site and information security policies, vital records protection through the use of remote site storage of microfilm originals and backup computer tapes, and regular maintenance checks are only a few program elements that often predate the formal emergency management process. The plan, however, reviews, coordinates, improves, and supplements these existing elements so that a comprehensive, cost-effective program emerges.

An emergency management plan for records and information works most effectively in the hands of

a knowledgeable, creative, and confident records and information manager. Such a manager can exert the strong leadership needed to serve as coordinator, and can quickly assume the responsibility for identifying, isolating, and managing the consequences of emergencies, and for directing reconstruction and salvage of those records vital to the successful resumption of business in the event of a disaster.



### Small Business Tip

- Concentrate on recovery of vital records. Retrieve and restore electronic data as quickly as possible.
- Contract with a recovery service for packing as well as recovery rather than attempting the recovery steps with limited organizational resources.
- Videotape or photograph all damage.



## Chapter 8 Checklist

### Records and Information Recovery

- Assess damage to records and information and document the nature and extent of damage.
- Stabilize the situation.
  - Prepare and pack records for recovery.
  - Transport records to recovery site.
- Begin appropriate records salvage procedures.
- Begin restoration procedures.

### Resumption of Operations

- Clean and repair or replace the damaged facility.
- Clean and repair or replace damaged furniture and equipment.
- Restart nonessential equipment, processes, and systems.
- Resort, organize, and index salvaged records and information.
- Reshelve or refile salvaged records and information.
- Evaluate disaster response and recovery activities and make appropriate changes to the plan.
- Monitor affected areas for any continuing problems.

### NOTES

1. Pearl Holford, comp., *Disaster Plan for the Virginia State Library and Archives* (Richmond, VA: Virginia State Library and Archives, 1991), 9.

2. Barbara A. Rike, "Records Disasters Can Happen to You!" in *Proceedings of the 40th Annual Conference in Nashville, TN, October 22-25, 1995*, by ARMA International (Prairie Village, KS: ARMA International, 1995), 453.

3. Holford, *Disaster Plan*, 8.

4. ARMA International, *Glossary of Records and Information Management Terms* (Prairie Village, KS: ARMA International, 2000), 25.

5. *Ibid.* 25.

6. Blackmon-Mooring Steamatic Catastrophe, Inc., *BMS CAT References* (Fort Worth, TX: Blackmon-Mooring Steamatic Catastrophe, Inc., 1996), 38.