



Loss Control Insights

Disaster Recovery Guidelines - Property and Equipment

As businesses resume operation after a disaster, business contingency plans are put into action. Even without an established business contingency plan, losses and downtime can be minimized. This can be accomplished by having the building, its systems and equipment assessed and repaired before resuming operation.

The following measures should help in assessing damage from natural disasters. Depending on the type of loss, the items below may require more or less emphasis. Some of the activities in this document may exceed you or your employees' expertise and may require that you seek professional assistance. Be sure to notify the local fire department and building code officials of all significant work to be completed.

General Area, Structure and Contents

Following a disaster, a damage assessment should be conducted and action plans developed to address priorities:

- Safety hazards, such as downed power lines, exposed electrical wires, leaking gas, etc., could be present. Identifying these hazards may require a phone call(s) to local utility companies prior to returning to your facility.
- Buildings should be evaluated for structural damage or undermining of building foundations. Professional assistance from a structural engineer, architect, etc., may be needed.
- An assessment of the availability and status of equipment and supplies necessary to resume operations should be performed.
- Temporary repairs should be completed and hazards minimized to help ensure personnel can safely access the building.
- Caution should be exercised when opening fuel control valves. A check should be performed to ensure that piping and equipment is intact, properly supported and not leaking. If problems are noted with the piping and/or equipment, the valve(s) should not be opened, and professional assistance obtained.
- Any unnecessary ignition sources should be eliminated, including the enforcement of "No Smoking" regulations.
- Strict precautionary measures should be required for any cutting, welding or hot work that will occur in or around the buildings. For additional information, please refer to the Technical Bulletin entitled *Cutting, Welding and Hot Work Operations* on the Travelers Risk Control Website
- A procedure should be established for removing debris resulting from the disaster and any subsequent reconstruction efforts.

- Any damaged doors, windows and skylights should be covered immediately. Coverings should be substantial enough to resist expected wind, rain or snowfall, and should not allow moisture penetration.
- Photograph and/or videotape any damage to buildings or contents to document conditions prior to repairs.
- Water-damaged porous furnishings, such as carpets, upholstery and ceiling tiles may need to be discarded, to help eliminate microbial contamination.
- Non-porous surfaces where moisture collection has prompted microbial growth should be cleaned and disinfected with non-ammonia-based detergents or a simple 10 percent bleach and water solution. Surfaces should be allowed to air dry.

Fire Protection Equipment

- Fire protection equipment and alarms should be assessed for potential impairment. In areas of widespread power outage, there may be insufficient water for fire protection systems.
- All fire protection systems including fire pumps should be assessed. All sprinkler systems that were turned off should be tested and returned to service. For additional information, please refer to *Fire Protection Impairments — Are You Prepared?* on the Travelers Risk Control Website.
- Have main drain (2-inch drain) tests conducted on all water-based sprinkler systems and compare to pre-disaster test results to help ensure that there are no shut valves or impaired sprinkler water supplies.
- The integrity of fire protection alarm and security alarm circuits should be assessed. Alarms should be fully tested. Repairs should be made as needed.
- The local fire department should be notified of any extended fire protection impairment.
- All smoke detectors should be cleaned and tested if dust has infiltrated the building.

Electrical Systems

- Damaged utility-owned electrical service equipment and downed power lines should be cordoned off until the utility's representatives can complete repairs and restoration.
- If water has contacted electrical system components, or if there has been significant wind and/or flood damage to the building structure or foundation, the system should be de-energized at the service entrance until inspection, cleaning, drying out and testing are completed.
- All electrical system inspection, repairs and testing should be done by a licensed or otherwise qualified electrician.
- Electrical interrupts should be prominently tagged and the tags should be securely attached so as to help avoid inadvertent or accidental removal.

Restoring Flood- or Rain-damaged Electrical Equipment

- All electrical and electronic equipment, especially those with cooling fans (computers, servers and telecommunications rooms) should be checked for excessive dust infiltration. Excessive dust in equipment may cause overheating and fires.
- Flood- or rain-damaged equipment should be thoroughly cleaned, dried out and tested before it can be re-energized and operated.
- For equipment with only light accumulations of dirt, the preferred cleaning method is vacuuming, followed by blowing out with compressed air at less than 25 psig and then wiping clean with dry lint-free rags.
- Equipment with heavy buildups of mud and sediments require washing with clean water. A hose stream at no more than 25 psig should be used to wash away the mud. After washing, the cleaning method above should be utilized.
- Flood waters often entrain oil and grease. Greasy deposits should be removed from the un-insulated metal parts of the apparatus with petroleum distillate solvents. Chlorinated solvents should not be used. Only mild solvents, such as Stoddard cleaner, should be used on electrical insulation or motor windings.
- Electrical enclosures should be dried with infrared lamps, portable resistance heaters with fans or, if ambient air is sufficiently dry, incandescent lamps and fans. Motors that operate up to 600 volts can be partially disassembled and dried out in ovens at no more than 115 degrees Fahrenheit (46 degrees Celsius). Large motors that operate at more than 1,000 volts should be sent to motor repair shops for drying out.
- Electrical insulation integrity tests must be completed prior to re-energization.
- Insulation should be tested with a 500- or 1,000-volt DC megohm-meter. Tests should be conducted phase-to-phase and phase-to-ground. Normally, measured minimum should be at least 50 megohms for distribution switchgear. Equipment must not be re-energized if insulation resistance measures less than 1.5 megohm — more cleaning and drying is necessary.
- Polarization index testing should be performed on motors. This is the ratio of the 10-minute megohm-meter reading to the one-minute measurement. Motors must not be operated if the polarization index is less than 2.0. If readings are less than 2.0, additional cleaning and drying out is needed.
- Cooling fans must be restored to service, all ventilation passages must be cleaned and dried, and all air filters must be replaced prior to operating electrical equipment.

Mechanical Equipment

- All gas, steam and flammable liquid piping systems and associated tanks should be checked for leaks or damage.

- The water supply for boilers, process feed and cooling water should be tested. Underground storage tank contents should be tested for contamination before use.
- Mechanical equipment should be cleaned. Shafting should be checked for alignment and lubricating systems flushed.

HVAC Systems

- HVAC systems should be inspected by a trained HVAC technician to ensure it is mechanically safe to restart.
- Air filter replacement and air duct cleaning – filters and duct systems should be inspected and a decision whether to replace and/or clean should be made on a case-by-case basis.
- All areas where water leakage and collection has occurred should be promptly repaired.
- Any accumulation of stagnant water under cooling deck coils of air handling units should be identified and eliminated.
- Relative humidity should be maintained below 60 percent in general air spaces and low-velocity plenums.
- Any fiberglass insulation that has become wet should be removed and replaced.
- All cracks in exterior walls should be repaired to prevent outside air infiltration.

Plumbing Systems

- All exposed plumbing piping systems should be checked for leaks or damage.
- Ceiling tiles and floors should be checked for water damage from hidden pipes.
- If water has been shut off, the building should be inspected immediately after service is returned.