



## Loss Mitigation Action Plans

### Preparations For The Loss of Essential Services

#### Risk Solutions

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August 2017

Your business can lose critical services when you least expect it. Are you prepared for the sudden loss of electric power or other utilities? Are you ready for the disruption of your equipment that is controlled by electrical devices? Now is the time to review and reinforce your business contingency plans. Thoughtful planning for events that may put your business at risk can pay large dividends when these events actually do occur.

#### Loss of Electric Power

The loss of electric power will stop most machinery. Depending on the time of the year and your climate, it will also raise the possibility of temperature related losses. This includes loss of perishables due to inadequate refrigeration and the possibility of severe damage to piping and processes through freezing, overheating or loss of temperature control.

If a loss of electric power represents a serious threat to your business then effective preparations can be made to mitigate damage. Certain known factors may increase the likelihood of knowing when to expect a loss of power. This could include high risk periods such as winter conditions.

- **Prepare generators.** If engine generators are available, perform pre-operational checks and test them by periodically starting the engines. If possible, run the generator under load. Proper training should be provided for personnel expected to operate the standby generators during outage conditions. A written procedure should cover all power loss scenarios and be updated as appropriate.
- **Keep generator fuel tanks full.** If an engine-generator set is supplied by fuel stored on site, make sure that the fuel is fresh. Many instances of failure to start or failure to carry the load are caused by improperly maintained, fresh, fuel. *Never use fuel which has been in storage for more than 12 months.* This is true for diesel as for any other liquid fuel. Stored fuel can also accumulate algae, which can quickly plug fuel strainers and filters.
- **Anticipate power surges.** Power interruptions from any cause are frequently accompanied by voltage surges. Surge protection is always recommended for protection of sensitive circuits, especially those serving electronic power supplies associated with computers and automation controls. If you have such equipment which is not adequately protected from surge damage, consider shutting it down when power outages are expected. Consult an electrical engineer or contractor about installing power quality hardware with an



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effective grounding system in your facilities. **See the paragraph entitled "Freeze"** for precautions to be taken in the event of power loss during cold weather.

### Loss of Telephone Service

Telephone service interruptions affecting a significant geographical area usually do not result in property damage. However, if interruption of communications would affect your business adversely, alternative communications should be considered. Cellular service is sometimes more resistant to local line interruptions than your landline telephone wiring. Having a pre-planned configuration which will permit the use of cellular handsets as a substitute for voice and data lines might be an effective low cost backup plan. A written backup communications plan should be part of your disaster contingency plan.

If interruption of telephone service could be a serious hardship, then other communication backup facilities should be evaluated, including commercial radio transceivers and satellite links. Computer data links are available via cable services. This technology represents a redundant communications link provided the cable service does not share facilities with telephone carrier.

Telecommunications may represent a vital part of your business. For some, even short duration equipment failure could cause significant lost revenue. Permanent decentralization of service to two or more geographically-separated, redundant telephone service locations should be considered.

Each of the sites has inherent capability to assume the call volume of the other for at least short periods of time. This is the domain of telecommunications experts and is beyond the scope of this article. Decentralized service impacts the entire business enterprise including the computer systems which support telephone operations.

Whatever the nature of your telecommunications needs, power quality plays an important role. The risk of damage to vital telecommunications hardware posed by power and telephone line voltage irregularities makes the use of proper surge suppression devices a necessity.

### Floods

We all know that floods can occur as a result of weather phenomena. But it can also occur as a result of power interruption or machinery failure which interferes with continuous dewatering using pumps. These systems are necessary in some types of property that are located at or below the local water-table. It can also occur as a result of bursting pipes. The following recommended action steps are designed to address flooding regardless of cause.

### Before the Flood:

If flooding is expected, the following steps should be taken to minimize damage to equipment and to make post flood recovery as rapid as possible:

- Make sure all personnel are evacuated from the property before the rise of floodwaters.
- Remove as much property and equipment as possible to high ground storage. Move the highest value property first.
- Construct flood barriers with sandbags or other materials. Even if these do not hold back flood waters, they may resist flood currents sufficiently to prevent the destruction of structures.
- When flooding is imminent, shut down all fuel burning equipment which is subject to flooding. In the case of steam boilers, it is best if these can be allowed to cool prior to immersion.
- De-energize all electrical circuits prior to immersion in flood water.
- Get all vehicles to high ground.

### After the Flood Recedes:

These recommendations are intended to assist in restoring your property and equipment after a flood recedes:

#### Boilers

- Carefully inspect foundations and settings of boilers for settlement. DO NOT OPERATE a boiler if there is any evidence that the foundation has been undermined.
- Make sure the setting (brickwork, refractory, and insulation materials) is thoroughly dry. Use portable heaters where necessary.
- All safety appliances, such as safety and relief valves, steam gauge, water column, high and low- water cutouts, and blowdowns must be cleaned and repaired as needed.
- All controls must be inspected and tested before operation, especially the water level controls and low-water fuel cutoffs.
- Burners should not be fired until checked by a burner technician. An explosion may occur if the combustion controls do not function properly.
- Boilers should not be operated if proper feed water is not available. If operation is essential, and if feed water contains mud, it will be necessary to blow down the boiler every eight hours. In addition, the boiler must be opened and cleaned at least once per week until proper water quality is re-established.

#### Electrical Equipment

- DO NOT ENERGIZE equipment which has been flooded until properly cleaned, dried and tested. This includes enclosures, busways, conduit and cables.
- Windings in electrical machinery should not be dried at temperatures exceeding the rating of its insulation system. In general, a maximum temperature of 194 degrees F or 90 degrees C may be used. Check with the manufacturer for equipment specific information and recommendations.
- Dry type transformers should be cleaned and thoroughly dried as described for windings.

- Oil filled transformers should be thoroughly inspected for damage and oil samples should be drawn from top and bottom for lab analysis. *The laboratory should be instructed to include a Karl Fisher test for water content.* Maximum water content is 35 ppm. If water is found in the oil tank, the oil charge must be remediated by a competent transformer service firm.

### Before Operating Machinery

- Contact the manufacturer for recommendations.
- Inspect foundations for cracking, weakness, or settlement. If settlement is suspected, check and correct alignment of all shafting. Check all stationary components for being level.
- Inspect all machine internal components for silt accumulations. Clean as needed.
- Open the cylinders of all reciprocating engines or compressors. Remove any foreign material or water that is found.
- Drain and clean lubrication systems. Wipe the oil containing elements with lint-free rags and refill with new lubricants as required.
- Carefully clean and TEST governors and controls.

### Freeze

Any interruption of power during cold weather is a freeze hazard. These proactive steps must be taken to help avoid or reduce damage.

- **Building closures.** Make sure all doors, windows, shutters, and dampers that can be closed are in place and secured to minimize heat loss
- **Snow and ice removal.** Remember that the roof and other exterior equipment may need to be cleared of snow. Removal of snow from roofs is heavy and dangerous work. Consider experienced and qualified roofing contractors for this work.
- **Anticipate flooding.** If the premises may be flooded as a result of severe cold weather, take precautions and plan for subsequent flooding. Move susceptible equipment or stock to an alternate location if feasible. Check for proper operation of pumps or other dewatering equipment.
- **Collect and circulate a list of emergency telephone numbers.** Distribute them to everyone in the organization who may need them during a disaster event.
- **Heating systems.** If backup electric power is not available, make arrangements to obtain portable heating units which do not require electric power.
- **Protect piping.** Piping systems which could freeze must be monitored. Be sure that heat-trace systems are energized and working properly. Be prepared to supply standby power to heat tracing systems. Drain the piping if heat-trace systems are not working. *Pay particular attention to fire-sprinkler systems. Any change in the readiness status of your sprinkler systems should be reviewed by your local fire department.*

For more information on these and other subjects, call you Hartford Steam Boiler representative.

**[Editor's Note: These recommendations are general guidelines and are not intended to be exhaustive or complete. They are not designed to replace information or instructions from the manufacturer of your equipment.]**

*Robert Weir joined Hartford Steam Boiler in 1993 and was appointed Director in 1995. He has an extensive background in the design and construction of power generation and industrial equipment and systems. A graduate of the U.S. Naval Academy, he holds a Master's Degree in mechanical engineering from Worcester Polytechnic Institute and is a graduate of Suffolk University Law School. He is a member of the American Society of Mechanical Engineers (ASME), a permanent committee member of the National Fire Protection Association (NFPA 37), and is admitted to Massachusetts and federal courts, including the U.S. Supreme Court.*

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**NOT IF, BUT HOW**

ES435 (rev 08/2017)