



Hartford Steam Boiler



Risk Solutions

Stores with Refrigerated Food

Hartford Steam Boiler
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Overview - Stores with Refrigerated Food, Grocery
Stores, Supermarkets

Underwriting & Loss Control Considerations for
Food Stores

Loss of Refrigeration - It Could Spoil Your Day



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Spoilage is among the first thing that comes to mind for most of us when we think about the risks associated with retail food establishments; conjuring thoughts of melting ice cream, wilting produce, and meat spoiling. However, there are additional concerns that could impact the business operation of food retailers. What if the electric doors won't open and customers cannot enter? How can payments be processed if the point of sale equipment isn't operating or if the credit card data link isn't communicating?

There are numerous pieces of equipment that are crucial to the operation of a modern retail food location. This includes the Heating Ventilating, Air Conditioning, and Refrigeration Equipment (HVACR), sophisticated electronics, and IT hardware.

It all starts with electrical power. The building owner is typically responsible for the incoming power supply and distribution within the store. One power feed into the building and several circuits within the building is the most likely setup. An electrical failure can cause the entire facility to shut down, or worse yet, result in a fire. A good electrical maintenance program is important to minimize the chance of a power failure or the potential of a fire and associated perishable goods (PG) loss. Grocery stores as small as 30,000 square feet in floor area (300 feet by 100 feet), can have PG values in excess of half a million dollars.

To minimize PG losses due to power loss, a properly sized standby generator is important to maintain operation of the HVAC&R systems. These standby generators are usually "covered equipment" and can have a value of over \$200,000 for a 30,000 square foot store. HVACR systems are especially critical to food retail establishments due to the heat generated by operating refrigeration equipment and the quantity and value of the perishable goods. HVACR systems usually consist of several pieces of equipment that can be located within the store, mounted on the roof, or both. The equipment should be serviced regularly by a qualified technician.

Sophisticated electronic systems and the related IT support equipment are not only commonplace in most stores but may be indispensable for day-to-day operations. These systems include point of sale, security, and inventory control. Poor power quality can damage this equipment and result in the store closing.

Lightning strikes, weather related events, or even car accidents involving a utility pole in the parking lot can result in poor power quality. Electrical systems should be equipped with an uninterruptible power source (UPS) and devices to protect this electronic equipment and maintain operation of the store.

An effective electrical maintenance program, a properly sized backup generator, and redundant refrigeration equipment can address most of the concerns addressed above. These preventive actions should minimize the chance of a significant fire, equipment breakdown, PG, or business interruption loss.

This is a summary of coverages. For all coverages, terms, conditions and exclusions, refer to the actual insurance policy.



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This guide sets forth underwriting considerations for equipment breakdown/business interruption and perishable goods risks. This overview pertains primarily to commercial food stores, but it is also a valuable resource for underwriting refrigerated warehouse storage facilities.

Power Loss

The loss of electrical power supplying refrigeration systems is second only to fire as the single largest severity risk in food storage facilities and food stores. Loss of electrical power affects all perishable goods. Any type of failure whether it is a transformer, localized electrical wiring, an automobile accident to nearby power lines or an area blackout can result in a significant, if not total, perishable goods loss. Typically, food stores have a single utility electrical entrance.

The risk is virtually eliminated when the power system is supplemented by an adequately sized "back-up" power source. Consider the following types of power supplies and how they affect the risks:

- a. **Emergency / Standby generators:** Emergency generators typically provide only life safety power for the customers to safely exit the facility and do nothing to protect the perishable goods. The power requirements for life safety varies but is typically < 5KW for food stores. However the power ratings of commercial generators typically start at 25 KW. This mismatch can lead to confusion as to what loads can be powered or not powered by the installed generator. It is important to know if the generator is sized for life safety or standby power.
- b. **Pre-wired transfer switch:** can provide a rapid response with portable standby generators that can be under pre- event annual rental agreements.
- c. **Permanently installed standby generator:** the preferred solution that provides power for all the refrigeration, heating and air conditioning systems. Power requirements for refrigeration, heating and air conditioning systems can range between 100 kW to 400 kW.

Perishable Goods Considerations

An accurate assessment of the value of perishable goods in the facility is extremely important in offering the appropriate coverage level. Understanding the product mix of the PG's sold at each location can help identify these values. For example, the display square footage of high value goods like meat and fish far outweigh the value of vegetables, dairy and bakery goods. Most stores now have electronic inventory systems which can accurately provide the peak value of PG on site.

- Open case displays use the most energy and have the fastest spoilage rate during short period power interruptions. Generally newer facilities are minimizing these types of displays.
- Temperature monitoring systems with remote annunciation have minimal costs. This service can be provided by many vendor or self-monitoring systems installed. Any location which does not embrace the sensor technology in this space is a higher PG risk.
- Underwriting should know how many food products could be lost with the loss of one compressor. There are some older facilities with a dedicated single compressor per display which are higher risks.
- Preventive maintenance plans for the refrigeration systems should be in place with repair records documented.
 - Usually the best maintenance programs involve annual contracts with local refrigeration contractors to ensure current best practices. Many contractors can offer off site monitoring of the major pieces of equipment at a reasonable price, identifying problems before they become a temperature issue.
 - Daily inspections by employees is valuable in alerting the contractors that something is different today (e.g., sounds, smells, vibrations). The employees are the eyes and the ears of the maintenance function, but rarely have the ongoing training to keep up with the developing technologies.
- Written pre-emergency plans and training is a low cost risk improvement. This should provide sequential steps and contacts for assistance including;
 - Electrical contractors
 - Mechanical contractors
 - Building contractors
 - Portable cold storage units
 - Security services

Surge / Electrical Transients

Surges (transients) and electrical noise are the highest frequency loss events in food stores, with few events matching the destruction and losses of electrical and electronic equipment. Over 60% of all claims are attributed to this cause of loss.

Surge protection devices, Uninterruptible Power Supplies (UPSs) and other power quality protection devices should be installed in the store. The appropriate devices and the location of these devices should be selected by a qualified electrical contractor. They should be at locations to protect:

- a. The building electrical power entrance
- b. Each refrigeration power feed
- c. Electronic systems
 1. Protection of the computer system
 2. Cash/credit card payment systems
 3. Wireless systems

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Refrigeration is something the average person seldom thinks about. When was the last time you opened your refrigerator or freezer and paused to marvel at the fact that it stays cold with virtually no effort on your part? Have you stopped to think about what would happen to the contents if the refrigerator stopped working?

Refrigeration is a critical factor in many businesses that touch your life every day. Loss of refrigeration can not only shut down many businesses, it can also render their entire inventory unusable.

We All Depend On Refrigeration

For a perspective, it is easy for you to realize that refrigeration equipment is at work when you walk down the frozen foods aisle at your supermarket. How about when you stop by the combination gas station and quickie market on your way home and pick up a gallon of milk? Or when you order dinner at your favorite restaurant, or when your local school serves lunch to your children?

Do you think about refrigeration when your doctor gives you a shot? Do you wonder what temperature those boneless chicken breasts were stored at before you brought them home? Do you know how those goods on the frozen foods aisle were frozen to begin with?

What Is Spoilage?

A large number of businesses require refrigeration to prevent something from “spoiling.” For purposes of this discussion, we will define spoiling as something becoming unusable due to exposure to temperatures that are too high for too long a period of time.

To some frozen food businesses, “too high” might be 25 degrees F, and “too long” might be a few minutes. Many expensive drugs and pharmaceuticals are considered unusable if they are not constantly stored in a very narrow and closely monitored and documented temperature range.

To the business owner, spoilage might not just mean loss of today’s product or income. It could easily result in permanent loss of customers and adverse publicity that can affect potential customers.



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So, What Can Go Wrong?

In a doctor's office, a self-contained fully automated unit very similar to the one that you have in your home might supply refrigeration. An ice cream plant, however, might employ multiple large refrigeration systems that use ammonia as a refrigerant. They might maintain 25 degrees below zero F storage conditions that are controlled by very sophisticated and highly technical automatic electronic systems.

These systems "know" what different temperature and humidity ranges to maintain in different rooms and areas at different times of day and days of the week. They also may be programmed to run an automatic defrost cycle, told how often to monitor specific temperatures and when to consider a temperature excursion or refrigerant leakage a condition requiring an alarm. They may even have a remote notification system to require acknowledgement of a problem.

Despite the advances in refrigeration systems condition monitors and controls, spoilage continues to occur in just about all types of businesses that use refrigeration. Spoilage can happen very quickly if proper temperatures are not maintained due to loss of refrigeration. Specific refrigeration equipment failure modes and examples have been exhaustively reported in previous issues of The Locomotive, but the major causes of spoilage today continue to be electrical power supply outages and mechanical failure of refrigeration equipment.

As systems become more and more sophisticated, however, an additional potential source of problems is the system controls being programmed incorrectly or even "forgetting" what they are supposed to do and when they are supposed to do it. Properly operating and maintaining refrigeration equipment and controls is the best way to reduce the probability of spoilage. However, if a problem does occur, the two key elements of controlling the situation are simple ones. You have to know what is happening when it is happening, and you have to do something about it quickly.

How Do I Know If Something Is Wrong?

Timely detection and notification of refrigeration loss is the first line of defense against a Perishable Goods Loss.

A reliable method of continuously monitoring the temperature within the refrigerated space. This sampling system should be tamper proof (hard wired, locked, remote trouble etc.).

- Alarm points appropriately based on the documented requirements of the items being refrigerated and set to generate an alarm whenever conditions indicate loss or substantial reduction of refrigeration, but well before spoilage might occur. The alarm points should exhibit fail safe operation. In other words, complete loss of electrical power should create a refrigeration loss alarm.

- The system should minimize false alarms. Devices such as a defrost cycle delay timer can prevent alarms being generated during normal operating conditions.
- You must have a reliable method for observation of an alarm. The sophistication of this system should be dependent upon the value of what you have refrigerated. It may be as simple as a single point set temperature sensor with a simple red light and a single notification alarm. It might be a very sophisticated multiple point multiple range continuous temperature monitoring system that is manned 24 hours a day, seven days a week.
- The detection and alarm system should be tested at least monthly, and the results logged for future reference.
- A written and practiced procedure should be in place for responding to the alarm. This is known as pre-emergency planning.

Pre-Emergency Planning

Once a potential spoilage situation is detected, there is little time to respond. The most rapid responses can only occur if a proper pre-emergency plan is in place. Remember that the operator's judgment can be challenged during the emergency.

A good pre-emergency plan is a document that includes a few basic elements that can be planned well in advance of a refrigeration problem:

- Specific responsibilities are delegated to specific persons.
- How to determine if the alarm truly reflects a loss of refrigeration situation.
- Detailed steps to be followed to reduce the probability of spoilage.
- Specific names and numbers of key contractors, equipment suppliers, refrigerated truck sources and/or alternate cold storage facilities, and insurance company contacts.
- Specific steps for salvage, reclamation or disposal of goods if it should become necessary.
- Periodic review and update of the pre-emergency plan.

The Bottom Line

Upon annunciation that a power outage has occurred, prevention of spoilage might be as simple as making sure the door to the refrigerated space is not opened until electrical service is restored.

It might require more stringent measures such as having access to self-contained refrigerated trucks to store the products during a power outage or while equipment is being repaired or replaced.

In any event, if appropriate detection, notification, and pre-emergency planning have been developed, documented, and are frequently tested, spoilage is much less likely to occur.

This article is not meant to be exhaustive or complete, nor is it intended to replace information or instructions from your equipment vendor.