

INSURANCE BASED RISK MANAGEMENT FOR SWINE FACILITIES

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What causes one barn to burn while another of the same style and construction era remains standing forever? No one really knows. Generally the only thing left after a barn fire is a smoldering heap of wood, ashes, steel, concrete and dead animals. The lack of eye witness accounts and the total devastation of the structure often leave fire experts such as the Ontario Fire Marshal and insurance adjusters scratching their heads to determine the cause.

There can be many causes for a barn fire: lack of maintenance, electrical problems, heat lamps, corrosion of components, methane gas explosions, but pinning the cause on one of these is difficult. Often when a fire destroys a barn the cause of loss is categorized as “unknown origin – suspected electrical.”

So how can barns be made safer, and less prone to fire? When it comes to swine confinement facilities there are some very specific steps that you can take to ensure that your barn is less prone to fire.

The first step is to always ensure that you have working fire extinguishers inside the building and that they are maintained on a regular basis. It may seem like a simple thing, but often fire extinguishers are not maintained inside barns, and if they are in place, they become good spots to hang items such as clothes, hats, or extension cords. Fire extinguishers should be mounted in all areas of the barn, but should also be present in some very specific locations. These locations include: by the electrical panels, near feed mixing rooms, inside mechanical rooms, and close to every door that separates one area of a barn from another. Ideally there should be one fire extinguisher mounted permanently to the wall every seventy-five feet throughout the barn.

The next step you can take to make sure that your barn is less prone to fire is to always ensure that spec-grade electrical equipment is used within the barn, specifically when it comes to receptacles. Spec-grade electrical receptacles are specially designed electrical receptacles that meet demanding specifications. Spec-grade electrical receptacles are generally similar to ordinary residential use electrical receptacles except that the terminals are fabricated from high strength copper alloys instead of ordinary copper alloys such as 70/30 (70% copper, 30% zinc) cartridge brass.

Manufacturers must use the higher strength alloys because terminals made of lower strength alloys can become overstressed and will fail to adequately secure an electrical plug which is inserted. Since the materials used to construct the receptacle are of a higher grade, the gases that are found in most swine confinement buildings will not attack the components as quickly

and could extend the life of the receptacle. Remember though that, as with most items found in a barn, the spec-grade receptacles will still need to be maintained on a regular basis.

This brings us to the second step – Maintenance. Maintenance of the systems within your barn is very important. These systems include the structure itself, the plumbing system and the electrical system. Many people forget that their electrical system needs to be maintained on a yearly basis, just like any other piece of equipment on your farm. Regular maintenance by a qualified electrician can save you money and headache when something breaks down at an inconvenient time. Having an electrician inspect the system to look for problems with the wiring or for signs of overload is a critical factor in maintaining your barn.

As well as maintaining the electrical system, you should also inspect both the plumbing system and the building itself. The plumbing system will not cause your barn to burn, but it should be included in a yearly inspection of the premises. Part of that yearly inspection should be a thorough review of the condition of your barn. Look for areas where there is a build-up of dust or debris and clean it. Look for weak or damaged trusses or areas where there may be impact damage to poles or beams. Also look for areas where material has been stored against heating devices, or where material is blocking access to electrical panels or disconnects.

The heating systems in your barn are also critical components that could lead to a fire if they are not maintained or if they were installed incorrectly at the design stage or after they have been repaired. Maintenance of your heating system will benefit you in two ways. First, a properly maintained heating system operates more efficiently thereby saving operating costs. The second benefit is that a properly maintained heating system may lead to a decrease in risk potential for a fire. Insurance inspectors often highlight problems associated with heating systems. The list of problems noted include; missing heat shields, units installed too close to combustible materials, debris around boilers, unit heaters with rotten or damaged jack chains, damaged gas or propane lines to the heaters. Money spent to maintain your heating system by a qualified individual is never wasted. Often we see heating units that have been modified or repaired in such a way as to make them extremely dangerous. Maintaining your own equipment may seem like a cost savings, but the reality is that heating technicians are trained to look for problems that may not be apparent with your system.

Maintenance of the barn also brings about new risks that you may not have thought about. Whenever welding or cutting is carried out inside a swine barn there is always the possibility of a fire starting, either at the moment the work is being done, or later due to smouldering ignition of materials near where the work was completed. The development of a hot work permit may help to reduce the likelihood of a loss. With a hot work permit, all of the employees in the barn are made aware of the requirements that are set in place before the welding or cutting begins. Most insurers have developed these programs themselves for use by their policyholders or will help you develop a specific program for your barn.

A thorough inspection of the attic is also warranted on a yearly basis. When you are in the attic, look for signs of water or mold damage. The underside of the roof should be carefully inspected to ensure that moisture damage has not occurred. If the attic is humid, a thorough

inspection of the gusset plates on the trusses can help to point out areas of concern. Rusted gusset plates are a sure sign of a humid or wet attic and that problem needs to be dealt with immediately. If you have gusset plates that are rusted or corroded, a qualified builder should be contacted to determine how serious the problem is and what potential solutions there may be.

All newer barns are required to have fire separation walls in the attic. This wall should be inspected to ensure that there are no breaches in the wall. Often openings are cut in these walls when access to certain parts of the barn is needed and are then not sealed. The fire separation wall in the attic may not appear to serve a purpose due to its design, but it will slow the spread of fire through a structure and must be maintained in order to provide this level of fire prevention.

If you are thinking about building a new barn you should consider the installation of actual fire walls that are designed to prevent a fire from escaping from the compartment that it is designed to protect. By design, all swine barns could easily be constructed with a two hour fire wall that would separate the building along the natural breaks that exist between barn sections. The additional cost of the firewall during the construction phase is a small price to pay to protect your investment in the structure, the animals and your future. Although a fire wall is not required by the current building code, there are insurers that mandate the use of these structures and base their rating on the presence or absence of them.

Another area of concern in some older swine facilities is sprayed in place polyurethane foam insulation and exposed foam insulation such as Styrofoam SM™. The risk potential for a total loss fire increases quickly when there is exposed foam, and underwriters and loss prevention personnel will often point out the foam and ask for it to be covered. These types of insulation are extremely flammable and if they are not covered by some form of fire barrier or intumescent paint they pose a great risk to the structure and although they may not be what causes a fire they add a substantial fire load to a building. Although the building and fire codes allow you to have the unprotected foam insulation in an agricultural building, many insurers will require that the foam be coated with a fire retardant or that it be covered with a non-flammable coating.

You may not think that barn operation could impact the likelihood of a fire in a building, but it can play a huge role and has been instrumental in several large swine facility fires in the last year. In the last couple of year's methane gas explosions and fires have become a disturbingly normal occurrence. For a methane gas explosion to occur several factors must occur in just the right set of circumstances, and the exact nature of what happens is purely speculation since no two fires are identical.

With that said, some factors appear to be common in these types of fires and explosions. First they seem to happen mostly in pit ventilated barns, and when the barns have been left empty between crop cycles. Methane gas appears to have built up inside the closed building and when the heaters are turned on again the methane mixes with the oxygen in the air until it reaches its upper explosive limit and then ignites due to the presence of the open flame heater.

The methane burns at the ceiling and if there are any flammable materials there, they readily ignite.

By being aware of the presence of (or the potential for) methane gas to build up within a barn, farmers can take precautions that could save their building. The first step is to not shut the heat off and close up the building when there are no animals inside. Leaving the heat on and keeping your fans running prevents the methane from building up to explosive limits. The second thing you can do is to vent the building prior to turning on the heaters after the barn has been idle. This will vent the gas from the building and should keep the level of methane below the lower explosive limit.

The steps listed above are best management practices, and are intended as a guide only. Many insurance companies have qualified loss prevention staff as part of their risk management team and they are an incredible source for information regarding fires and loss prevention on the farm. If you have any questions, be sure to ask your broker or agent if your insurer has access to fire prevention information.