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Builder Developer

Loss Prevention Toolbox

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Preface

There are many resources on the development and implementation of Safety Programs. In fact, an employer can be cited by Occupational Safety and Health Administration (OSHA) if written safety plans have not been prepared. Conversely, there are very few resources devoted to developing a program for the prevention of property losses.

OSHA's primary concern is worker safety while the insurance industry's focus is loss prevention. These goals are complementary; an employer committed to safe worksite will in all probability also have a low property loss experience.

However, it is precisely because OSHA's priority is worker safety that this handbook has been prepared. As an example, Hot Work is the leading cause of industrial fires in terms of severity in damages. As one of the most severe fire hazards, it deserves tight controls. OSHA requirements and recommended good practices have not been updated in nearly a decade despite the multitude of losses, because the casualties have been exceedingly low; there is inadequate concern for the property loss potential.

Additionally, this handbook will not duplicate the mandated worker safety programs specified by OSHA. It will provide guidance on topics that in the experience of the insurance industry have caused or contributed to property damage losses.

Organization

This handbook has 4 sections. The main body is the discussion of loss prevention topics that could be anticipated in the day-to-day operations. It has been presented to achieve two purposes:

- Provide tools and resources for the development of Loss Prevention policies and procedures.
- Used as leader's guide for weekly safety presentations; known as "Toolbox Talks".

The organization is as follows:

Statement of Issue - why the topic presents a loss potential.
Code Reference - the justification that the topic requires attention.
Discussion - an exploration of how the loss potential can affect your project.
Action Plan - the "how to" strategy to mitigate the loss potential

Annex A presents loss exposures that probably will not affect your project. Still, there needs to be awareness of the rare exposures and have a response prepared.

Annex B contains reproducible forms that can be used in preparing the site's loss prevention programs.

Annex C is the handbook guidance that it is hoped is never used - what to do after a loss.

1. Foundation

Statement of issue

Loss prevention is the combination 'human element' programs, policies and procedures that when integrated into the ordinary day-to-day activities, can control the causes of loss and eliminate the contributing factors to losses.

Construction projects add a layer of complexity to preventing losses. While the workers in the various trades (plumbers, electrician, carpenter, etc.) are responsible to the project management team, they are only ultimately accountable to their employer. The loss prevention program needs the willing participation of all the participants in a project.

Code reference

Title 29 Code of Federal Regulations (CFR), Part 1910, Section 38 (29 CFR 1910.38) OSHA regulations requires businesses with more than 10 employees to develop and maintain: 1) an Emergency Action Plan, and 2) a Fire Prevention Plan.

Discussion

From the OSHA reference above, employers are obligated to develop and maintain a safety program which includes Emergency Action Plan and a Fire Prevention Plan programs.

This handbook is the 'how to' manual to both fulfill your Loss Prevention obligations and to integrate Loss Prevention with the customary activities so the programs are not burdensome.

Action Plan

- The owner (owner's representative) shall designate a person who shall be responsible for the loss prevention program and who shall ensure that it is carried out to completion. (The language in the standard is emphatic and imperative.)
- The Loss Prevention Program Manager shall have the authority to enforce the provisions of this and other applicable fire protection standards.
- In the event of an emergency, any duties and responsibilities of the designated Loss Prevention Program Manager are to be shifted to low priority so his/her total focus can be to responding to the emergency.
- An "Emergency Operations Center" should be created where decisions are made, where information is disseminated, where emergency responders liaison with the site people, and most importantly, minimizes the time lost 'looking for information'.

A sample Emergency Operations Center checklist can be found in Annex B.

2. Hot Work

Statement of issue

Hot work is one of the leading causes of industrial fires and often results in a total loss of the project. It is considered the Number One fire hazard; it deserves the tightest controls.

Fires caused by hot work are rarely directly ignited by the flame or arc but by sparks (globules of molten metal) or by hot parts falling onto combustible materials - often out of the sight of the operator.

Hot Work is defined as: any temporary or permanent operation involving open flames or producing heat and/or sparks. This includes but is not limited to: brazing, cutting, grinding, soldering, torch applied roofing and welding.

Code reference

National Fire Protection Association (NFPA) 51B: *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*
29 CFR 1910.252

Discussion

Hot Work as a leading cause for fire loss is amplified when the work is performed by temporary workers (contractors) who: 1) are unacquainted with the unique hazards and exposures at a site, and 2) based on their familiarity with the hot work processes, have developed a sense of complacency. Utilizing a 'permit system' demonstrably reinforces the seriousness of the hot work hazards.

Optimally, hot work hazards can be minimized by using 'cold' alternatives (such as sawing instead of torching) or by relocating the hot work offsite or to a designated "safe" area. Otherwise, a permit will be required. NFPA 51B states that a "permit authorizing individual" (PAI) be designated that personally evaluates the area where hot work is to be performed and determines which precautions must be followed and that these stipulations are to be presented in the form of a permit. The PAI and Fire Prevention Program Manager (NFPA 241) can be the same individual.

Action Plan

- Management or a designated agent shall be responsible for the safe operations of hot work activities and shall designate a Permit Authorizing Individual (PAI) who is familiar with NFPA 51b and any agreements made with the Insurance Company (typically noted in their Fire Prevention Agreement or Questionnaire documents).
- All individuals involved in hot work operations shall be aware of the inherent risks at the site and understand the emergency procedures.
- The PAI shall personally evaluate the area where hot work is to be performed and determine which precautions that shall be followed. Also, the PAI shall revisit the area to verify that the stipulated precautions are, in fact, being followed.
- The necessary precautions are to be stipulated on the Hot Work Permit.
- No hot work can proceed until a Hot Work Permit has been issued.
- Hot Work hazards should be discussed in weekly safety meetings with representatives of all subcontractors.
- Have an adequate fire extinguisher on standby. The proper type and size of extinguisher for the situation such as Class A and Class ABC.
- The PAI should be aware of the wind and if (s)he believes the wind would preclude the effective application of the fire extinguisher, then the permit should not be issued.
- Hot Work Permits (the task itself and the fire watch concluded) expire one hour prior to end of shift.

A sample Hot Work Permits (in English and Spanish) can be found in Annex B.

3. Smoking

Statement of issue

Carelessly discarded lighted smoking materials is a leading cause of industrial fires.

Because the smoking habit is hard to control, people will smoke, prohibitions notwithstanding. The problem intensifies when smokers conceal themselves in obscure places or intemperately discard their lighted smoking materials out of fear of discovery.

Code reference

NFPA 241 *Standard for Safeguarding Construction, Alteration, and Demolition Operations*

Discussion

The entire jobsite should be designated as a no-smoking area. Areas well detached from the jobsite that are clear of combustibles can and should be designated as a safe smoking area.

If a clearly defined 'no smoking' program has been established, yet discarded cigarettes are still discovered, it would be easy to conclude that someone or a group of persons were intentionally circumventing the smoking policy. Management should investigate/address the possibility that worker(s) who disregard this safety precaution could potentially disregard all safety precautions. and it would be prudent to ensure there are no 'bad actors' on the jobsite.

Action Plan

- Establish a smoking policy that includes disciplinary penalties for violations.
- Clearly mark the facility as "Smoke Free."
- Clearly mark areas in which smoking is permitted. Provide for the proper disposal of smoking materials within the smoking area.
- Inform visitors of the smoking regulations, and make sure they observe them. The smoking policy must apply to everyone.
- The smoking policy should be routinely (at least once a month) evaluated to note its effectiveness. If smoking activities are continued in unauthorized areas, consider amending the smoking policy. For example, institute fines for cigarette butts found in the building; as the team managing the site is often aware of which groups are working in respective sections of the building and sometimes even know which crews based on the type of cigarette butts found.

4. Electrical Hazards

Statement of issue

Electrical appliances, power tools and lighting present two hazards; the overloaded circuits and hot surfaces can cause fires, and the potential exists for shock hazards.

Code reference

NFPA 70 *National Electric Code*
NFPA 241
NFPA 1 *Fire Code*
29 CFR 1926 Subpart K-Electrical

Discussion

Worker safety (shock hazards) has ample discussion in the OSHA standards.

Fire hazards and loss prevention safe electrical practices also depend on diligent assessments of the appliance, tool, wiring (extension cords), plug ends, Ground Fault Interrupter (GFI) breakers. Additionally, the ampacity of the extension cords shall not be less than the rated capacity of the portable appliance supplied by the cord.

Action Plan

Electrical equipment and the associated wiring should undergo a visual inspection (at least weekly) that verifies that the following conditions are acceptable:

- Temporary wiring is grounded and properly installed/isolated.
- Electrical devices are maintained and kept in safe operating conditions.
- Extension cords maintained in safe conditions that prevent them from being physically damaged, such as being driven over by a vehicle.
- In renovated spaces, extension cords shall not be installed under rugs or carpets and shall not be run through doorways, or through holes in the ceiling, walls, or floors.
- Do not plug multiple extension cords together.
- All branch circuits originate in an approved power outlet or panel board.
- Branch circuits and conductors are protected by properly rated overcurrent devices.
- Temporary lighting installed to prevent contact with combustible materials.
- Temporary lighting, wiring, connections, and insulation are kept in safe conditions.
- Temporary lighting is removed immediately when it becomes no longer necessary.

Never attempt to repair a damaged cord with any type of tape. Damaged equipment and cords shall be removed from service until rendered safe. Cords can be repaired in compliance with 29 CFR 1926.404(b)(1)(iii)(C).

5. Transformers and Switchgear

Statement of issue

This chapter is limited to systems less than 33KV. These systems can be located indoors or in subgrade vaults. Switchgear is the combinations of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment.

Transformers convert the utility supplied voltage to the voltage that is suitable to the user. Switchgear is located both on the utility side and the service side of transformers. Transformers are either air cooled or cooled by a contained dielectric fluid which in many cases is combustible.

Code reference

NFPA 70: *National Electric Code*

Discussion

The failure of these systems is rare, but it often is catastrophic. An arc flash can injure people in the vicinity and it can melt the cabinets containing the systems.

Some units contain toxic Sulphur Hexafluoride gas which can be released.

Transformer dielectric can ignite and burn until it is consumed. These fires produce large volumes of dense, toxic smoke.

Action Plan

Prepare a firefighting plan of action for these systems.

Ensure anyone operating the switchgear has the appropriate personal protective equipment.

If the systems are in areas subject to flooding (particularly in coastal areas where salt water is present) be sure they are isolated from the utility (de-energized) prior to contact with water.

The rooms housing indoor systems should never be used for storage (with the exception of spare parts for the devices/systems within that room).

Spare switches, disconnects or circuit breakers should be kept for critical circuits (life safety and essential operations).

Transformers, capacitors and some fluorescent light ballasts manufactured prior to 1977 may contain PCB (polychlorinated biphenyl) which is a suspected carcinogen. Most devices have been removed from service but if some old systems are discovered, assume they are contaminated.

Systems larger than 1000 kVA should be serviced annually by a qualified vendor. Service should include a thermographic scan.

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6. Fuel Hazards and Engine Driven Equipment

Statement of issue

The use of liquid fuel (gasoline, kerosene or diesel) and engine driven equipment (generators, compressors, paint sprayer pumps) introduces many significant fire hazards.

The focus here is on portable equipment, not engine driven yard machinery.

Code reference

NFPA 30 *Flammable and Combustible Liquids Code*
NFPA 241

Discussion

Actual fire testing involved the comparison of two identical fire scenarios; with one test having just one gallon of gasoline involved. While both were set on fire, the scenario with gasoline had a significant acceleration in the burning that the fire became totally involved in less than a minute while the area without gasoline remained 'manageable' for many minutes. The test demonstrated that introducing even a small amount of fuel creates an unacceptable exposure.

Action Plan

- No fuel storage greater than 60 gallons can be within 50 ft. of wood framed areas or combustible stacks.
- No fuel storage or fuel fired equipment can be within 30 ft. of wood framed areas or combustible stacks.
- Fuel storage areas/containers or engine driven equipment cannot be located on combustible surfaces.
- All portable fuel containers must be "UL listed*" safety cans.
- All engine driven equipment must be allowed to cool prior to refueling.
- Fuel storage areas must be kept free of weeds and combustible materials. Each area shall be provided with "No Smoking" and "Flammable" signage. A fire extinguisher must be within 30 ft.

Please note, equipment related to Temporary Heating does not apply to this chapter; refer to the Heating Appliances Chapter for more information.

*Listed: Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states that either the equipment, material or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

7. Heating Appliances

Statement of issue

Temporary heat introduces a significant fire hazard. Heaters using liquid fuel (typically kerosene or fuel oil) presents fuel handling hazards. Heaters using gaseous fuel (propane or natural gas) introduce the hazards associated with pipe and hoses being damaged. This is one of the few fire hazards that may need to operate near, or within, a combustible space, due to the heat output and need to minimize running gas/fuel lines.

Code reference

NFPA 241

NFPA 31 *Standard for the Installation of Oil-Burning Equipment*

NFPA 54 *National Fuel Gas Code*

Discussion

The ideal temporary heating would be an indirect system with forced air distribution. This eliminates the introduction of fuel and excessive heat into the space, minimizing exposure to combustion and exhaust.

Action Plan

- No solid fuel heating appliances (or open burning) shall be used. All heating appliances shall be "UL listed."
- Liquid fueled appliances must be allowed to cool and then be re-fueled out of the building.
- Gaseous fueled devices (natural gas, propane) should have the hoses/piping protected from damage, being run over or snagged (being pulled) by material movement.
- Gaseous fueled devices should be provided with appropriate valves and regulators. Heating appliances shall be inspected at least hourly by a competent person.
- Heating appliances shall be protected from contact with combustible materials (including wind-born debris).
- Heating appliances shall be provided with tip-over devices arranged for safe shut-down. Propane fueled heaters should never be used in basements (the vapor is heavier than air and could collect).
- Heating appliances shall be checked on an hourly basis while operating. If running after-hours, someone must be on-site to check these units.
- Excess flow valves should be provided for the natural gas fueled temporary heating devices at the gas supply connection. These devices shall be listed and shall be sized and installed in accordance with the manufacturers' instructions.
- Schedule regular inspections and preventative maintenance on heaters and accompanying hoses, and fuel tanks. Maintenance should be performed by a qualified service company.

8. Housekeeping

Statement of issue

Inadequate housekeeping results in a buildup of debris, such as scrap wood, paper, packaging materials, wood shavings and sawdust. This debris introduces the presence of easily ignited materials while also increasing the overall fire load of the building.

Code reference

29 CFR 1910.22a

Discussion

Good housekeeping is a vital part of mitigating property losses. Proper housekeeping does not just happen. It requires the leadership and wholehearted support of management, as well as the cooperation of all workers. The overall goal is to have no more than a day's worth of debris accumulate within, or near, the structure.

Action Plan

- Create a written program for proper housekeeping and establish acceptable levels of cleanliness.
- Designate the Loss Prevention Program Manager to be responsible for proper housekeeping.
- Clearly inform all workers of the Loss Prevention Program Manager authority and responsibility.
- Actively demonstrate support of proper housekeeping practices through regular, positive reinforcement.
- Inspect the facility daily to determine current levels of housekeeping.
- Trash and waste containers should generally be emptied once a shift, but the frequency will depend on the amount of debris each process generates.
- Establish cleaning methods and make certain the necessary equipment is available.
- Establish responsibility for the completion of each cleaning task and assign a completion time.
- Determine a sufficient number of people are assigned to each cleaning task. This will likely change depending on the particular tasks occurring on site.
- If necessary, consider instituting fines to ensure crews are doing their part.

9. Material Handling

Statement of issue

The introduction of combustible construction materials (lumber, trusses, sheeting), fixtures and systems (HVAC, electrical, plumbing) in cartons, and other materials packaged in combustible wrapping, all add to the overall fire load within a structure.

Code reference

NFPA 241

Discussion

The presence of these materials within the structure both add to the fuel loading and their presence can obstruct escape paths or firefighting access.

Materials staged outside, and near, the building present an exposure fire challenge to the structure. The staging of materials inside the building should be prohibited unless the storage is protected by automatic fire sprinklers.

Because fire sprinklers are often not available during construction (or outside the building), the goal should be to limit material staging; no more than what's needed in a given work day.

Action Plan

- Yard storage of combustible building materials should not be staged within 30 ft of any structure. Materials should only be staged near the building as needed for the given work day.
- Ensure the staging of materials does not obstruct exit pathways.
- Packaging, cartons and wrappers must not accumulate within the structure; refer to the Housekeeping section for more information.
- If materials are to be staged inside the building, the installation of automatic fire sprinklers should be completed and in service.

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10. Debris Removal and Trash Chutes

Statement of issue

Construction wastes typically accumulate in large, open top metal bins. The majority of the contents of these bins is combustible and includes easily ignited materials. This introduces a significant fire exposure.

Code reference

NFPA 241
NFPA 1
29 CFR 1926.852

Discussion

Because of the fire exposure, Dumpsters and containers with an individual capacity of 1.5 cubic yards or more shall not be stored in buildings or placed within 10 ft of combustible walls, openings, or combustible roof eave lines.

A special case exists for exterior trash chutes as these units may require the dumpster to be located closer than 10 ft. from the structure. These need to be reviewed by the local fire responders.

For Trash Chutes, please refer to the agreements made with the Insurance Company (typically found in the Fire Prevention Agreement or Questionnaire documents) as certain configurations are allowed.

Action Plan

- Ensure Construction and Demolition (C&D) debris is disposed of in accordance with local regulations.
- Schedule the emptying of the Dumpsters at a frequency that precludes overfilling or the accumulation of debris outside of the bin.
- Arrange for proper housekeeping in the vicinity of Dumpsters.
- Keep Dumpsters at least 10 ft. from any building.
- Construction Trash Chutes shall be made of non-combustible material per ASTM E-84 OR have temporary sprinkler protection as per NFPA 241 OR provide a fire-retardant plastic chute with scaffolding that places the chute at least 5 feet away from the structure. Additionally, non-metal chutes claiming they are non-combustible must have documentation to verify they are non-combustible per the referenced standard.

11. Site Access

Statement of issue

Firefighting and rescue efforts are dependent on the emergency responders having unimpeded access to all sections of the project.

Code reference

NFPA 241

Discussion

Construction activity involves all-terrain capable vehicles where the surface conditions are not a deterrent. Conversely, rescue and firefighting apparatus require suitable driving surfaces.

Action Plan

- A central accessible location shall be designated that contains keys, plans, emergency information and other needs for use by emergency responders.
- Every building shall be accessible by fire department apparatus by means of roadways having an all-weather driving surface of not less than 20 ft of unobstructed width, having the ability to withstand the live loads of fire apparatus, and having a minimum of 13 ft 6 in. of vertical clearance.
- Access for use of fire department apparatus shall be provided to the immediate job site at the start of the project and maintained until completion.
- Dead-end fire department access roads in excess of 150 ft in length shall be provided with approved provisions for turning around fire department apparatus.
- The required width of access roadways shall not be obstructed in any manner, including obstruction by parked vehicles.
- "No Parking" signs or other appropriate notices, or both, prohibiting obstruction shall be permitted to be required and shall be maintained.
- The access roadway shall be extended to within 150 ft of all portions of the exterior walls of the first story of any building.
- Where a bridge is required to be used as access, it shall be constructed and maintained using design live loading sufficient to carry the imposed loads of the fire apparatus.

12. Interior Access

Statement of issue

The pace of construction often has vertical development overtaking the installation of interior stairs, particularly with steel fabricated stairs that are not installed until the stair tower is completed. This often leaves the upper floor access limited to using ladders; some of which are owned by the various trades which do not leave them usable; and other ladders that are 'homemade' that do not have any capacity rating.

Code reference

NFPA 1
NFPA 241

Discussion

Construction workers may have the agility to negotiate ladders between floors but this is not the case for rescue workers or for firefighters responding to emergencies and carrying equipment.

Action Plan

At least one stairway (temporary or permanent) should be provided to each floor as the building progresses vertically; the stairs should never be more than one (1) floor below the uppermost floor. Stairways should be lit and kept free of obstructions.

13. Emergency Action Plan

Statement of issue

Experience has demonstrated that even with optimal detection and suppression systems in place; the adverse effects critical situations is magnified without deliberate forethought on how to react to emergencies or other abnormal circumstances. This often has been the difference between a routine event or chaos and catastrophe.

Code reference

NFPA 241
29 CFR 1910.38

Discussion

Every worker within a facility must clearly understand the procedures for reporting emergencies. No worker should feel compelled to address any emergency beyond their level of comfort or ability, or if they perceive a threat to their own safety.

It shall be project management's responsibility to ensure that all workers are aware of the procedures to follow in the event of an emergency. Further, it is critical that key players demonstrate confidence when responding to emergencies and this comes from adequate preparation.

Action Plan

- Post the emergency reporting phone number throughout the facility and on each phone; and ensure that all workers are familiar with the number.
- Ensure that all areas of the facility have telephone access (either land line or via cell phone).
- Assign someone to meet the public fire department or other emergency response agencies at the facility entrance and direct them to the emergency area.
- Ensure that emergency response personnel and vehicles have access to the incident scene.
- If arson is even remotely suspected, immediately secure the fire scene so no evidence is disturbed. Notify the proper authorities.
- Provide a watchman if conditions are such that unauthorized entry is possible.
- A system or device (air horn, siren, etc.) should be provided that can notify workers of abnormal or emergency conditions or for evacuation purposes.
- Special accommodations will need to be provided for hearing impaired workers and workers not proficient in English.
- Workers should immediately evacuate to an assigned muster point or to the 'storm safe' area knowing that the customary escape route may be obstructed.
- A program should be developed (and kept current) that can verify that all workers are accounted for.

14. Coordination with Fire Agencies

Statement of issue

The expectation of construction workers is construction (carpentry, plumbing, electrician, etc.) and not combatting fire or handling medical emergencies. The primary responsibility of project management is to ensure the safety of the workers which in most cases, is evacuation. In emergency situations, there must be a reliance on the training, talents and skills of the emergency responders - and their equipment. In order for these efforts to be effective, they must have the opportunity to prepare their action plans.

Code reference

NFPA 241

Discussion

Fire responders and emergency responders are charged with preparing incident response plans (pre-fire plan) for each property in their jurisdiction. This function includes knowing the access to the site, the location of fire hydrants, the availability of protection features, and the hazards associated with each site.

Construction projects are unique where the building status is continuously changing so the emergency responders need to update their plans.

Their advice should be solicited when preparing and reviewing the site's emergency response plan.

Action Plan

- The Loss Prevention Program Manager shall be responsible for the development of prefire plans in conjunction with the fire agencies.
- Pre-fire plans shall be updated as necessary.
- The pre-fire plan shall include provisions for on-site visits by the fire agency.
- Ensure the responding fire department is aware of the status of all fire protection features.

15. Manual Fire Protection

Statement of issue

Buildings under construction typically will not have automatic fire suppression systems (fire sprinklers) provided and in service until the project is nearly completed. Firefighting will be entirely dependent on manual efforts.

Manual firefighting can either be by workers or by the fire department responders.

Code reference

NFPA 241

Discussion

In the event of a fire, the primary objectives are safely evacuating workers and to notify the fire department responders.

Workers, if they have adequate training and sufficient confidence and reasonable comfort, can operate fire extinguishers and attempt to extinguish an incipient stage fire.

Firefighters are taught that fire doubles in size each minute it is not extinguished, so having a charged fire extinguisher close by is critical.

When the fire department responders arrive, all workers should already have evacuated and reported to their supervisor for a "head count". The fire department's first priority will be to ensure everyone has safely left the structure.

The fire department responders will evaluate the fire scenario and either attack the fire internally using their own hoses that will be supplied by the building's standpipe system, or they will attack the fire externally using hose streams.

Action Plan

- Provide adequate numbers of fire extinguishers and distribute them per the recommended spacing.
- Fire extinguishers need to be routinely checked. Someone should be doing a visual check at least once per month to see if units still have a charge and are not damaged.
- Fire extinguishers need to be serviced or replaced annually.
- The monthly and annual checks on fire extinguishers should be documented. The service tags on fire extinguishers are the most common method.
- Ensure the workers have received adequate training on the use of fire extinguishers. Specifically included in the training should be the understanding that a worker is never obligated to attempt to extinguish a fire if there is any distress or discomfort.
- Free access to fire equipment shall be maintained at all times.
- In all new buildings in which standpipes are required, such standpipes shall be installed and maintained in conformity with the progress of building construction; even temporary setup is used as the building goes vertical.
- Ensure the responding fire department is aware if the standpipe system is or is not in service.

16. Mold

Statement of issue

'Mold' is a generic term - much like 'weeds'. There are an estimated 1.5 million species although fewer than 400 have been proven to cause disease. Some are beneficial as they produce useful antibiotics, good cheese, and port. Some reduce "bad cholesterol" as effectively as certain commercial drugs. Conversely when mold spores are present in large quantities, they can present a health hazard to humans, potentially causing allergic reactions and respiratory problems. Some molds also produce mycotoxins that can pose serious health risks. The presence of molds makes a property untenable and not marketable regardless of the species.

Once a mold infestation has been discovered, it must be remediated by cleaning, encapsulating or by physically removing the affected material, depending on the advice of experts. Consult the experts on whether removal is necessary in any of affected areas.

Code reference

None.

Discussion

Mold spores are present everywhere. Mold does not become relevant until they form colonies. For mold to reproduce, moisture, oxygen, nutrients (typical building materials), temperature (above 39°) and time (as short as 7 hours) is required. Since all the required elements are always present, effective mold control is a matter of moisture control.

Action Plan

- Material Delivery: Inspect incoming materials to ensure that they do not present a mold problem.
- Material Storage: Schedule just-in-time deliveries to minimize on-site material storage. Goods should be kept in the shipping wrapper until needed. Materials should be stored on dunnage or pallets to prevent ground contact and allow airflow through the stacks.
- Wetting during construction: Allow rain-soaked materials and areas to dry before being used or covered.
- Do not install materials that are not moisture tolerant (sheetrock, insulation) until the project is weathered-in.
- Particular attention needs to be directed towards roof and other exterior penetrations to assure potential areas for water entry are addressed.
- Avoid using unvented fuel-fired heaters as the products of combustion include large volumes of water.
- Verify the admixture of concrete and gypcrete at delivery to confirm that the water content is within specifications. High moisture content materials take longer to cure and introduce excessive moisture into the vicinity.
- Excessively damp areas (gypcrete pours) should be provided with blowers to assist in drying the area.
- Areas where water accumulation occurred should have the water removed and an investigation made on how the water was introduced.
- Perform an end-of-day walk-through to verify that all window and door openings are shut, and all open penetrations covered sufficiently, to minimize the entry of weather.
- Install moisture barriers per specifications.

17. Passive Fire Protection Features

Statement of issue

Passive fire protection features are construction elements that impede the effects of a fire solely by their physical presence and that do not require any action or response. This would include fire rated construction (CMU walls, Type X sheetrock) and post-applied materials (spray-on fire proofing and fire caulk).

Fire doors also impede the effects of a fire solely by their physical presence but do require the ability to automatically operate (close) to be effective.

Fire rated construction will be inspected by the building official.

Code reference

IBC *International Building Code* Section 701
NFPA 241
NFPA 80 *Standard for Fire Doors and Other Opening Protectives*

Discussion

Fire rated construction and fire doors are given a time rating (in hours). These ratings are given by physically testing a sample across a furnace opening. Not only does the sample have to remain intact for the time duration of the test but it also must survive a water spray from fire hose at the conclusion of the test.

Fire doors will include a label designating the unit's fire rating. Fire doors are "listed" as a complete assembly meaning that the door, frame and hardware will carry the same rating.

Action Plan

- Schedule the passive fire protection features installation early in the construction process to minimize the spread of fire.
- Ensure the automatic fire doors are free to operate (not blocked open). At the very least, confirm that every fire door is closed at the end of the workday.
- Do not obscure the fire rating label on fire doors or devices.
- Ensure the fire caulk installers are factory certified.
- Schedule the inspections when the fire caulk installation remains visible, particularly at the wall-ceiling joints.
- Do not modify a fire rated device (damper, door, etc.).
- Do not tamper with ceiling tiles, unless necessary, as they provide a fire resistance rating to the ceiling members above. This includes moving the tiles, defeating the tile clips, attaching decorations, or suspending any object from the tile support frame.

18. Fire Sprinklers

Statement of issue

Fire sprinklers are the most common system for fire suppression, and the least costly in terms of cost per square foot and in terms of the extinguishing agent (water). Sprinkler systems arguably are the most efficient and effective fire suppression system, and the basic operation principle has mostly unchanged since their introduction in the 1890's. Modern fire codes and building codes mandate fire sprinkler installation in nearly every occupancy.

Fire sprinkler systems not only are suppression systems, but each sprinkler head is a fire detector (it responds to high temperatures and after it operates, the water flow triggers an alarm).

Code reference

NFPA 25: *Standard for the Inspection Testing, and Maintenance of Water-Based Fire Protection Systems*

NFPA 13: *Standard for the Installation of Sprinkler Systems*

Discussion

The fire sprinkler head is remarkably reliable having a failure rate (i.e. leaking) of about 1 in 4 million. Despite this, fire sprinklers are easily defeated. NFPA 25 addresses the inspection, testing and maintenance requirements for sprinkler systems.

Action Plan

- Never paint a sprinkler head or concealed head decorative covers. Manufacturers typically stipulate that sprinklers 'fogged' or covered by spray paint are no longer covered by the warranty.
- Never paint the decorative cover on concealed sprinklers.
- Never attach any object to a fire sprinkler head.
- Never use the fire sprinkler pipe to support anything.
- Sprinklers manufactured prior to 1920 must be replaced.
- Sprinkler heads installed in impact-prone areas required listed head guards.
- If there will be less than 300 sprinklers are installed in the finished building, there should be at least six spare sprinkler heads. If the number is between 300 and 1000 sprinklers, there should be at least 12 spares. If more than 1000 sprinklers are installed, then least 24 spares.
- Conventional fire sprinkler heads more than 50 years old need to be replaced OR submit representative samples from one or more sample areas to a recognized testing laboratory acceptable to the AHJ (Authority Having Jurisdiction) for testing. (During this operation, the sprinkler pipe should undergo an internal investigation.)
- Quick Response sprinklers that have been in service for 20 years are required to be tested. Retesting is required at 10-year intervals.
- Dry sprinklers that have been in service for 10 years must be tested or replaced. They must be retested at 10-year intervals. Sprinkler systems should never be shut off unless absolutely necessary; please refer to the Impairment Management Chapter when those actions are needed.

19. Suppression Systems

Statement of issue

Fire suppression systems, from the common sprinkler head to the more complex extinguishing systems, have certain commonalities. They are a system of fire detectors, extinguishing agent supply, and distribution mechanisms consisting of pipes and nozzles that are hydraulically designed to deliver a specified amount of extinguishing agent. Each system is designed specifically for the hazard to be protected and each operates automatically upon the detection of fire. Additionally, suppression systems have alarms that both sound locally and that transmit a signal to an alarm company.

For conventional fire sprinklers, a single vendor designs, installs and tests the systems. Complex suppression systems involve the collaboration of several vendors.

Code reference

NFPA 241

Discussion

Fire suppression systems are typically not placed in service until later on in a new construction project, usually just prior to occupancy. However, the NFPA codes states that fire suppression systems be placed in service "as soon as practicable". In renovation projects, the suppression system is already in place.

Action Plan

- There shall be no delay in the installation of fire protection equipment.
- Fire sprinkler systems cannot connect to the municipal water system until that piping has been tested and flushed. Ensure that the water supply installation also keeps pace with the project.
- The fire sprinkler installation should progress in pace with the building and be placed in service as soon as possible.
- Areas within the structure that are to be used for staging of materials should have the fire sprinkler system installed and in service.
- Be aware that testing of suppression system includes flushing of the system which may involve large volumes of water.
- Obtain and retain copies of all testing certificates.
- When suppression systems are live, ensure workers are aware so work is done carefully in those areas to prevent the system from accidentally discharging. Additionally, have a plan in place to prompt an immediate response should accidental discharge occur.
- Suppression systems should never be shut off unless absolutely necessary; please refer to the Impairment Management Chapter when those actions are needed.

20. Backflow Preventers

Statement of issue

The Safe Drinking Water Act (SDWA) is the federal law that ensures the quality of Americans' drinking water. Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards.

The regulations apply to as many as 160,000 public and private water purveyors.

One significant provision is that the supplier has been made culpable for the actions of the end user. To provide a layer of protection, the water suppliers require that the end user must be isolated or contained from the public source by back flow prevention devices.

Code reference

Safe Drinking Water Act (SDWA)

Respective state and local regulations.

Discussion

The principal types of mechanical backflow preventer are the reduced-pressure principle assembly, the pressure vacuum breaker assembly, and the double check valve assembly. Their use is determined by the local regulations and is segregated by the health hazard of the potential contaminates introduced by the end user. These designations are not consistent as some purveyors deem fire sprinkler systems as a ‘health hazard’ [due to stagnant water] while others do not.

Every mechanical backflow preventer must be tested annually and certified that it is operating within the manufacturer’s tolerances. Beyond this, the individual performing the test (and any necessary repairs) must be certified and the test equipment being used must be certified. The testing/certification typically is provided by independent agents as the municipality does not have the resources to test all the backflow devices in their jurisdiction.

Action Plan

- If the water supply for a fire sprinkler system must be retrofitted with a backflow device, the sprinkler system must undergo an engineering evaluation to determine if the change in the supply has affected the performance of the system.
- Above ground backflow preventers installed in heated enclosures should have the heater checked to ensure it is operable and that the thermostat is properly adjusted.
- Outdoor irrigation backflow preventers must be drained or winterized prior to freezing weather.
- The testing procedure includes shutting the water supply. Ensure all occupants are aware.
- Testing fire protection backflow devices will require notification of the alarm service company.
- The fire protection impairment management procedures must be followed when the fire protection water supply is shut for testing. (See the Impairment Management Chapter for more information).
- For critical water systems, redundant backflow preventers installed in parallel should be provided so there will not be any interruption during testing.

21. Pipe Leakage

Statement of issue

Pipe leakage and the resulting water damage losses account for a high proportion of insurance claims; even discounting water damage from wind-driven rain.

Code reference

NFPA 241

Discussion

Water damage can be caused by various systems utilizing piping; each designed and installed by separate vendors and often with little coordination among trades. Failures in any of these systems can release water, which can damage the structure, fixtures, and finishes. Leaks can occur at any time.

Action Plan

- Ensure the loss prevention program manager has been acquainted with the location and function all system controls, main isolation valve and zone control valves. This information should be documented on drawings that are also available to the fire emergency responders.
- Any unique shut-off tools or wrenches should be kept available.
- Coordinate all system tests with the loss prevention program manager so they have the necessary awareness of each test.
- Special attention should be given to untested relief valves and vent outlets from RPZ backflow preventers as these devices can unexpectedly discharge water.
- Be aware that testing of piping systems sometimes includes flushing of the systems, which may involve large volumes of water. Forethought needs to be given to ensure the area of the test can accommodate the water discharge. This includes ensuring that the grading is sloped away from the structure. If the suppression system is being tested and/or leaking, please refer to the Impairment Management Chapter for more as the system likely needs to be brought offline.
- If freezing weather is anticipated and adequate heating cannot be maintained in certain spaces, piping systems in those spaces need to be drained. Attention should be directed at low points and sections of piping that may trap water. For DWV systems, an approved antifreeze solution should be added.
- Consideration should be given towards water flow detection systems to help alert appropriate individuals to the presence of possible leaks. Some systems offer automatic shut-off capability along the domestic service once a leak is detected.
- The fire sprinkler system generally should not be activated until the system's has a water flow alarm (final or temporary).
- The site shall turn off the domestic water service at the end of the day; this may not be possible in renovation projects.
- If the site has a watchman, inform the guard on how to turn off water in the event a leak is discovered after-hours; including access to the water flow detection system if one is installed.

22. Roofing Operations

Statement of issue

Two types of roofing operations present a fire exposure to a structure.

Built-up roofs consists of layers of 'felt' that are adhered by hot tar or asphalt. This material is prepared (melted and heated) on site by fuel-fired portable kettles. These kettles present a fire exposure: 1) because they involve a burner assembly with fuel, and 2) the tar mixture is combustible and under adverse conditions, can become a large vat of burning liquid. (The optimum application temperature is 450° which is close to the ignition temperature of the mixture.)

Membrane roofs have heat-sealed seams that are adhered using open flame torches or electrically heated 'hot air welders'. Some membrane roofs and seams are adhered with flammable solvents.

Code reference

NFPA 241
NFPA 1

Discussion

Understanding that a tar kettle can become involved in fire is justification that these units cannot be operated within or on any combustible surface and must be kept at ground level and away from combustible spaces or materials. Tar kettles should have two 40B rated fire extinguishers (larger than most) within 25 feet. One 40B rated extinguisher must also be located on the roof in proximity of the tar dispensing area.

The torch application to seal roof seams is a specialized skill that requires a certain level of dexterity, otherwise, the roof membrane or insulation is damaged - before it approaches the point where it can ignite and burn. A unique requirement for torch-applied roofing materials is that the fire watch must remain for 2 hours after the work is completed as compared to a 1-hour fire watch for all other hot work operations.

'Hot-air welding' is an electrically heated operation that typically requires more power than what is available from the site's temporary electrical service. As such, portable gasoline powered generators are sometimes needed.

Action Plan

- Ensure that adequate and appropriate fire extinguishers are available for all roofing operations and/or for the tar kettle.
- Ensure that a trained operator is in constant attendance at the tar kettle.
- Ensure the burners, hoses, valves, etc. on torches and torch trolleys are inspected and in good repair.
- Provide a fire watch for 2 hours after the torch-applied roofing operation has been completed. If allowed by the local jurisdiction, the site may reduce that time to 1 hour if the fire watch also uses a thermal imaging camera during their watch; be sure to document which process is used on the hot work permit.
- Both dry chemical or CO-2 fire extinguishers (Class B) and pressurized water fire extinguishers should be provided as dry chemical and CO-2 are less effective outdoors in windy conditions.

23. Chillers and Cooling Towers

Statement of issue

A chiller is a machine that removes heat from a fluid via a vapor-compression or an absorption refrigeration cycle. Small capacity machines can be air cooled but most large units (greater than 100 tons) are water cooled, and most use cooling towers to remove waste heat.

The refrigerant can be toxic (ammonia), flammable (such as propane) and ozone-depleting (chlorofluorocarbons). The attempted compliance U.S. Clean Air Act with the has caused the HVAC equipment industry to seek refrigerants that have good environmental and thermodynamic properties. There is not one 'best' refrigerant.

These systems combined with heat exchangers are used to remove heat and humidity from occupied spaces (both for worker comfort and for process efficiency) or to remove heat from critical processes (i.e. chemical reactions).

Code reference

U.S. Clean Air Act

NFPA 214: *Standard on Water-Cooling Towers*

Discussion

The replacement time for large chiller systems can be 6 months.

Hot-water tanks, cooling towers, and evaporative condensers of large air-conditioning systems often operate at the temperatures that allow bacteria to thrive and have been the source of Legionnaires' disease. This is transmitted by inhalation of aerosolized water contaminated with the bacteria.

Cooling towers will either have combustible or noncombustible fill. Despite almost always being wet, cooling towers with combustible fill are subject to catastrophic fires. Combustible cooling towers should be protected with an automatic deluge fire sprinkler system.

Action Plan

- Servicing and decommissioning chillers requires the safe recovery of the refrigerants.
- Investigate the option of rental chillers (trailer mounted) for critical operations.
- If a system uses a refrigerant that breaks down into toxic substances when in contact with hot surfaces (such as in a boiler room), then a gas detection/alarm system must be used.
- The cooling tower water chemistry needs to be carefully monitored.
- Care must be addressed to drain cooling towers to prevent freezing.
- When selecting or replacing a cooling tower, ensure that it is FM Approved.

24. Boilers and Pressure Vessels

Statement of issue

Pressure vessels are tanks or other assemblies (such as fire or water tubes) that contain pressurized fluids (air, water, steam, or other chemical compounds) at 15 psi or greater. If the fluid is heated internally or externally, it is designated as a boiler – even if the heated fluid is not intended to boil.

Household water heaters are exempt unless they serve 4 or more housing units.

The ASME code provides requirements applicable to the design, fabrication, inspection, testing, and certification of pressure vessels operating at either internal or external pressures exceeding 15 psig. Such vessels may be fired or unfired (such as an air compressor tank).

The National Board administers accreditation programs for organizations performing repairs and alterations as well as established uniform standards for the inspection of pressure vessels.

Both boilers and pressure vessels present a loss exposure from failure (sudden violent release of pressure); however, boilers present the additional risk of a combustion explosion if the burner and/or fuel controls fail.

Code reference

Respective state and local regulations.

ASME - *Boiler and Pressure Vessel Code*

National Board of Boiler and Pressure Vessel Inspectors - *National Board Inspection Code (NBIC)*

Discussion

Nearly every jurisdiction has a mandate that pressure vessels (and the connected pipes) undergo annual inspections by National Board accredited inspectors. These inspectors may either be state employees or (most often) employed by the company that insures the pressure vessel.

Also, it is mandatory that repairs and alterations be performed only by National Board accredited organizations.

Action Plan

- Since the inspection of boilers must be performed while the vessel is cold, forethought should be given to when the boiler can be shut down to accommodate the inspection.
- Never attempt any repairs to any pressure vessel, these must be done by National Board accredited persons.
- If a fuel fired boiler's burner fails to ignite, do not attempt multiple re-starts; contact the service organization. The firebox may contain unburned fuel which could explode.

25. Loss Prevention Self-Inspections

Statement of issue

Project management often requires programs aimed at responding to situations that require an immediate resolution, but sometimes routine issues can deteriorate into worse situations because the infraction at the time does not represent an urgent situation or response.

Some systems already have mandated inspection programs (such as extension cords, powered hand tools, scaffolding, and fire extinguishers). Other systems without these inspection programs can be easily overlooked.

Code reference

NFPA 241

Discussion

The project management team should have a formal mechanism to evaluate the effectiveness of the loss prevention programs in conjunction with the other inspection programs.

Action Plan

- Designate the Loss Prevention Program Manager to be responsible for overseeing the program.
- Implement an inspection program that incorporates loss prevention topics.
- The inspection should be performed weekly.
- The deficiencies identified in the inspection should define the party responsible for resolution and generate a work order with expected completion timeframe.
- The inspection report should be reviewed by the project risk management.
- A project management representative should accompany inspectors as often as possible to observe the issues firsthand.

A sample self-inspection program is found in Annex B.

26. Insurance Company Recommendations

Statement of issue

The inspection program we employ is essentially a line-by-line comparison of the site's processes, and execution of those processes, against best in classes practices outlined in these chapters. Many of those practices are outlined in provisions, like NFPA 241 *Standard for Safeguarding Construction, Alteration, and Demolition Operations*, but also in the agreements outlined within the Security Agreement and Fire Prevention Agreement (or Questionnaire) documents. Deficiencies are unbiased and are measures on a pass/fail basis.

The goal during any loss control visit is for our field representatives to work with the site team to resolve any observed deficiency before the visit is concluded. Any identified deficiency that could not be resolved during the visit precipitates a recommendation. Sometimes, due to the severity of the issue observed, or how often it has been observed in prior visits, a recommendation is still issued because a more formalized response is necessary to ensure the deficiency is acknowledged and will be handled properly for the remainder of the project duration.

Typically, there are three (3) types of recommendations based on the severity of the deficiencies noted. If a recommendation requires correction actions from the insured, the actions should not only seek to correct the observed deficiency but examine the processes that allowed the deficiency to occur in the first place and adjust those processes, thereby preventing deficiencies from reoccurring.

Lastly, understand that field representatives inspect the project, but do not make any official statements on behalf of the insurance company as to whether the inspection was deficiency-free or not. The insurance company's Risk Engineers review the report created by the representative and determine if any deficiencies were observed, the severity of those issues, and if corrective actions are necessary.

Code reference

None.

Discussion

There is language contained within the insurance policy, under the Protection of Property clause, where **"It is the responsibility of the Policyholder to undertake reasonable and appropriate measures to prevent loss."**

If there are blatant disregards towards reasonable loss prevention efforts, this can be construed as a ***"material change in hazard"*** and affect the policy. If/when this has been determined to occur, certain legal steps are triggered which could culminate in policy cancelation.

Action Plan

- Review the recommendation to make sure it is understood, both in scope and consequences.
- Discuss the analysis with your insurance agent if necessary. If there is consensus, then designate the appropriate resources and establish a suitable time frame for the completion of the recommendation.

27. Cranes

Statement of issue

Cranes present loss exposure from dropping and from collapse. In both cases the largest exposure typically is to the victim objects (or structure) that the lifted object drops onto or the crane collapses into.

Code reference

29 CFR 1926.550

Discussion

Most dropping/collapse losses are due to improperly operated cranes. They usually result from overloading, misuse of equipment or operator error.

The second largest number of dropping losses is due to improper rigging.

Equipment failures occur for two main reasons. First, one or more of the rigging components are overloaded because of improper selection or improper use. Secondly, the rigging is damaged, corroded or deformed and does not achieve its rated load characteristics.

There is an old adage among loss investigators - "There are no small crane accidents."

Action Plan

- Verify the crane operator is properly trained and has the appropriate certifications.
- Verify the hoisting machinery has been inspected.
- Provide a wind velocity-indicating device at the top of the crane with an alarm located in the operator's cab *and at a remote location*. Set the alarm to sound when the wind speed is within 5 mph of the manufacturer's recommended maximum in-service wind speed.
- Ensure the riggers are properly trained.
- Ensure the rigging equipment is regularly inspected and maintained in serviceable condition.
- Rigging equipment should only be used for its intended purpose. Use for other means may cause the rigging to lose its load carrying ability.

Additional Resources

http://www.elcosh.org/document/1488/744/d000104/d000104.html

28. Substance Abuse

Statement of issue

Millions of Americans suffer from various substance abuse issues yet maintain their employment status as they struggle to control their addiction; the construction industry is no stranger to this.

Using drugs can not only physically impair the user but also negatively impact their decision-making abilities. This is a deadly concoction when on the job. A study by OSHA states that the most dangerous occupations, such as mining and construction, also have the highest rates of drug use by their employees.

Code reference

49 CFR Part 40
Various local and state regulations.

Discussion

Employee drug abuse costs companies billions of dollars annually in lost productivity, increases the risks of workplace accidents and violence, and greatly increases health care costs. Underscoring the seriousness of the problem, data shows that the prevalence of substance abuse in the workplace is on the rise.

It is also notable that persons having substance abuse issues are likely to seek employment where the policies are lax.

Action Plan

- Determine if pre-employment drug screening is to be integrated in the job application process - both for company employees and for contract workers.
- Establish written procedures to follow with regard to substance abuse, such as testing (both random and incident related), prevention and how to handle infractions of the policy. Ensure these policies are well publicized. Receipt and acknowledgement of these policies should be kept with employee records.
- The ideal program both enforces a no-tolerance policy as well as acts as an outlet for those who may have a problem and would like to seek help.
- The term "illegal drugs" should be precisely defined in the policy - particularly in jurisdictions that have 'decriminalized' medicinal or recreational marijuana and other drugs.
- These programs are put into action by familiarizing supervisors with the procedures. Be sure that all supervising staff members are knowledgeable of the drug code that is to be enforced.
- Supervisors should also know the signs and symptoms of drug abuse.
- Establish a liaison with both the local law enforcement and with community outlets that provide substance abuse counseling.

29. End of Day Closing

Statement of issue

A practice of following an end-of-day routine can assure that a facility is secure and that hazards can be discovered.

Code reference

None.

Discussion

Performing a project walk-through and perimeter tour prior to closing a job site provides an opportunity to discover and eliminate many hazards and loss exposures.

Action Plan

- Check for the obvious fire hazards (smoldering cigarette, fuel stored within the structure).
- Remove workers that are lingering.
- Ensure all appliances (temporary heaters, radios/chargers, power tools, sound systems etc.) are disconnected from power.
- Be aware of any systems that are to undergo overnight pressure tests. If domestic water is not needed, turn off all domestic water sources (do not turn off water to any of the fire lines/services).
- Be aware of pressure relief valves or backflow preventer vent valves as these devices can unexpectedly discharge water.
- Make note of any subcontractor area that exhibits substandard housekeeping (accumulations of trash, haphazard material arrangements, discarded food or packaging that could attract vermin, etc.)
- Look for tools, job boxes, ladders, etc. that are normally chained and locked but that are unsecure.
- Be aware if any subcontractor has an unusual accumulation of high-value goods, materials, or tools. If so, ensure those have been locked and secured, ideally removed from plain view.
- Check the perimeter fence that the gates are locked and look for sections that appear to be modified for easy removal or if materials have been located near the fence (either for use as a "ladder' to circumvent the fence or to enable surreptitious removal).
- Check the field of view for surveillance cameras and motion detectors; these might be obscured or misdirected.

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30. Written Programs

Statement of issue

Both NFPA 241 and OSHA regulations mandate the development of an Emergency Action Plan and a Fire Prevention Plan.

OSHA compliance can be satisfied by presenting documentation that these plans have been developed. However, OSHA does little to measure the effectiveness of these programs.

Conversely, the insurance industry is very concerned that 1) adequate forethought has been given to the development of these programs, and 2) these programs have, in fact, been adopted, implemented, and integrated.

Further, NFPA 241 not only stipulates what programs are to be developed but also includes who bears responsibility for the programs and offers how-to guidance on their development.

Code reference

NFPA 241
29 CFR 1910.38

Discussion

When evaluating loss prevention programs, it is an axiom among loss investigators - if it is not written, it does not exist.

A written statement of corporate policy is also critical in making the commitment to manage loss prevention and control these hazards. This statement, carefully worded, signed by the highest members of management and distributed throughout the organization, gives clear testimony that management has made loss prevention and control a corporate objective. (See next page for suggested language.)

It seems fitting that the closing chapter of this handbook serves as the 'call to action' to actually and literally create a document that contains the *Emergency Action Plan* and *Fire Prevention Plan* custom-made for YOUR facility.

Action Plan

- Ensure that each project/job site has a designated *Loss Prevention Program Manager*.
- Create loss prevention programs and policies tailored for the needs at your site. This can be as simple as preparing a document that states the Programs presented in this Handbook are OUR loss prevention and control programs.
- Review NFPA 241. This is available for review as a free resource on www.nfpa.org
- Develop an *Emergency Action Plan* and *Fire Prevention Plan* as mandated by OSHA 29 CFR 1910.38.
- Put these programs in writing.
- Use the resources of your insurance company. We *want* to help.

Sample Statement of Management Support for Loss Prevention

XYZ Corporation

MEMORANDUM TO: All personnel

The Board of Directors of ***XYZ Corporation*** in carrying out its responsibility to preserve corporate resources - for the benefit of our customers, stockholders and employees - recognizes that we must aggressively manage the prevention and control of property losses. To do this, we must give the same attention and dedication to managing these elements that we give to the management of the many other elements that contribute to our success as a builder of the highest quality.

We hereby make the prevention and control of property losses an integral part of the overall objectives of the ***XYZ Corporation.*** We intend to identify and evaluate all property hazards so that we may provide protection features to offset each hazard.

To accomplish this, we hereby direct the ***Divisional Vice President***s to:

1. Designate an individual as the "Loss Prevention Program Manager" at each project/jobsite.
2. Develop a written program for each of the elements identified in the *Loss Prevention Toolbox* supplied by our property insurance carrier, US Assure E&S.
3. Develop a written *Emergency Action Plan* and *Fire Prevention Plan* as mandated by OSHA 29 CFR 1910.38.
4. Ensure that the Loss Prevention Program Manager has adequate training, resources and authority to implement these programs.
5. Clearly communicate and demonstrate this authority through the underlying vendors and sub-contractors to assure consistent implementation.

The ***Divisional Vice Presidents*** of each profit center shall assume the responsibility for maintaining the accuracy and thoroughness of each program's content, as well as for the effective implementation of these programs throughout all facilities under his or her control. The annual performance appraisal for each ***Divisional Vice President*** shall henceforth include a critique of the success in fulfilling this objective.

Further, the Position Description of every employee of the ***XYZ Corporation*** shall include this duty: "To make a positive and continual contribution to the success of the corporation's efforts to prevent and control property losses, recognizing that every loss has a detrimental effect on the ability to meet our corporate, our customers and our personal objectives."

Signed this 3rd day of May, 2014

John Doe

President

As stated, this is a suggested Statement of Corporate Support for developing and maintaining written loss prevention and control programs. The key elements should be customized for names and titles. Any statement should definitively state the objective, the responsible players and a measurement tool.

31. Impairment Management

Statement of issue

A protection impairment occurs when a fire (or explosion) prevention, suppression, alarm, or supervisory system is shut off, impaired or otherwise taken out of service completely or in part.

Loss experience demonstrates that in properties having automatic fire suppression systems, these systems are 96% effective (successfully controlled or extinguished the fire).

64% of failures were attributed to the system being shut off before fire began. As such, both fire code officials and insurance companies direct significant resources towards managing impairments.

Experience also shows that a significant portion of impairments are initiated by outside contractors which demonstrate that facility management (the Impairment Coordinator) must ultimately manage any impairment.

Code reference

NFPA 1: *Fire Code*

NFPA 25: *Inspection, Testing, and Maintenance of Water Based Fire Protection Systems*

NFPA 72: *National Fire Alarm and Signaling Code*

NFPA 101: *Life Safety Code*

Discussion

There are three types of impairments: emergency, planned, and hidden. Each must be resolved as quickly as possible.

Action Plan

- The property owner or designated representative shall assign an Impairment Coordinator to comply with the requirements of this chapter.
- Fill out the Impairment Tag and hang the 'Shut Off' portion on each closed valve or other piece of impaired equipment. Keep the 'Reminder' portion in a conspicuous place in the office of the impairment Coordinator.
- Inform department heads in the buildings or areas where protection is out of service.
- Shut down hazardous processes such as hot work until protection is restored.
- Prohibit smoking, hot work and other ignition sources throughout the affected area.
- Notify the agency monitoring the fire alarm system.
- Notify the public fire department that protection is shut off.
- Expedite completion of the work. Work continuously until protection is restored.
- If the scope of the impairment changes, immediately discuss these changes with TRU.
- Verify by appropriate test that all fire protection systems have been restored.
- A sample Impairment Tag can be found in Annex B. Commercially produced impairment tags are also available.

32. Outside/Subcontractors

Statement of issue

Using outside contractors introduces loss exposures. These workers often are focused solely on their assigned tasks and are unaware of the unique challenges of the host building. Due to the familiarity of their specific task, these workers often develop a sense of complacency.

At times, outside contractors perform as if they are only accountable to their own management leading to indifference to local management's needs/concerns.

Code reference

29 CFR 1910.38

Discussion

Make certain that the employees of outside, and sub, contractors, whether participating in major construction, renovation, remodeling, or routine maintenance, follow the same loss prevention rules that apply to the facility's employees.

Detail these rules in written loss prevention instructions. Attach these instructions to all bid specifications and all signed work contracts to help ensure that the contractor is aware of the value management places on loss prevention.

The written loss prevention instructions should be discussed with the contractor's employees when they first arrive on the job site during orientation session(s).

Action Plan

Ensure that outside/subcontractors are aware of:

- Fire notification procedures.
- Availability and operation of fire and explosion suppression equipment.
- Impairment handling procedures.
- Hot work permit requirements.
- Smoking regulations.
- Housekeeping practices.
- Hazards alarm signals procedures.
- Emergency phone numbers.
- Contact information for site management.
- Contact information for the contractor's management team.
- Procedures for handling changes from working plans.
- Evacuation procedures (where to go and how to ensure they are accounted for).
- Severe weather precautions.
- Security concerns (badging/site access and restricted areas).

33. Physical Security

Statement of issue

Physical security is the combination of systems such as lighting, fencing, and other barriers, that deter unauthorized entry into a property. The purpose is to deter and impede trespassing.

Code reference

NFPA 241
NFPA 730

Discussion

Vandalism, malicious mischief, arson, and theft can occur in unattended or unsupervised areas that have little to no security. Physical barriers help deter unauthorized entry into a property as well as impede entry; allowing Active Security measures additional time to detect and respond to the intrusion.

Action Plan

- Provide chain link fencing (minimum 6 ft. high, unless specified otherwise within the Insurance Company's Security Agreement) at the perimeter of the project. Install gates at each fire are allowed on the jobsite.
- If necessary, fencing may need to be expanded beyond the property line, or collapsed into the site, so that a perimeter around the construction area can be maintained.
- Be sure to check the fence as part of the end of day closeout process to ensure the perimeter fencing is fully secured.
- The site shall provide on-site lighting. Motion-based lighting can be used in lieu of lights that remain illuminated throughout the evening. If in doubt on how to properly illuminate the site, coordinate with your Active Security services. They can provide insights on where lighting is needed.
- Once a security measure is in place, do not modify it in a way that reduces its effectiveness, such as leaving areas unfenced at the end of the workday, thereby no longer creating a full perimeter fence line. If compromising security is necessary, please notify the Insurance Company beforehand; ideally 2-3 weeks (or longer) prior to the change being made. A sample of the Security Modification request form has been added to this book; see Appendix B. Please also email that modification request, and any necessary documentation, to security.modification@truins.com

34. Active Security

Statement of issue

The ability to detect and prompt a response to the presence of intruders is crucial towards effective loss prevention and control. Most catastrophic losses occurring after-hours can be mitigated, if not entirely prevented, with an active security measure in place.

Code reference

NFPA 241

Discussion

Active Security typically falls into two broad categories:

1. A watchman, who make patrols throughout the property.
2. A surveillance system utilizing cameras, and other devices, to monitor and detect.

The key objectives for either measure is to reliably detect abnormal situations (i.e. fire, theft, vandalism, etc.) and promptly dispatch the appropriate response.

Action Plan

- Designate the Loss Prevention Program Manager to be responsible for overseeing the program.
- Select Active Security measures; refer to the Insurance Company's Security Agreement Document for directions on what to provide. This document can also help provide direction even if these measures are not required under the policy.
- If a watchman is used, their patrols must be recorded to ensure their patrols are performed, which should include tours within the building(s) under construction. These logs should be reviewed daily.
- Ensure the watchman is kept appraised of the hazards associated within the property and the response procedures. If the project also utilizes a surveillance system, have the two active security measures work together. Please also refer to the Pipe Leakage chapter of this book, as the watchman should aid in the response to leaks.
- If surveillance is selected, ensure all areas of the facility are covered by detectors/cameras. Additional devices may be needed to keep pace with the construction.
- Surveillance systems also require support systems (lights and fences) are kept intact and in service. If the site opted to provide power to the camera, please ensure to regularly check throughout the day that the power connection to the equipment was not disrupted or disconnected; this should be done at least once as part of the end of day closeout process.
- Once a security measure is in place, do not modify it in a way that reduces its effectiveness. If necessary to compromise security, please notify the Insurance Company beforehand. A sample of the Security Modification request form has been added to this book; see Appendix B. Please also email that modification request, and any necessary documentation, to security.modification@truins.com

35. Response to Site Intrusions

Statement of issue

Most job sites are an easy target for theft, vandalism, and arson, due to a lack of active and passive security measures present. Not all intrusions into the site are malicious in nature. For example, many homeless populations often break into building(s) under construction as a means of refuge from the elements and accidentally start an uncontrolled fire because they feel asleep while trying to stay warm. The frequency of intrusions can also be influenced by local law enforcement's general response to calls; with some departments not responding to the presence of an intruder until they commit a more violent offense.

Code reference

None.

Discussion

While insurance policies have a baseline set of security requirements, outlined in the Security Agreement for a given project, the policy's Protection of Property clause states the insured must take reasonable measures to mitigate and prevent losses. Frequent intrusions into the site, regardless of whether losses occurred from those incidents, must be acknowledged, with the insured taking action to ensure additional measures are added to prevent further intrusions.

Action Plan

- Consider where materials are staged/stored and how they are secured. The frequency of theft can often be the result of how recognizable these materials are from outside the property and the ease in which to quickly enter and exit the site with these items.
- Be sure end of day closeout procedures are executed at the end of the day, even if some trades are working later than the typical work hours, so that everything is properly secured for the evening.
- Keep all vehicles locked and secure the keys apart from the vehicle. Lock all gas caps.
- Your property should be inventoried, labeled, photographed, and your most valuable equipment and material should have the ability to be tracked.
- Provide additional physical deterrents such as such as, but not limited to, additional locks and chains, taller fencing, more on-site illumination, or barbed/razor wire. Equipment should be 'corralled' when left overnight.
- Arrange for 'just in time' materials delivery to minimize the accumulation of high-value materials sitting in storage.
- Consider adding or increasing Active Security on site, such as providing a watchman if the site or camera system or consider having both measures in place. The additional active measures not only add a layer of deterrence but increase the ability to detect and rapidly respond to intruders without relying solely on a police response.

Annex A - Low Probability Exposures.

Statement of issue

All of the information presented in the main body of this document is offered as assistance in planning for and responding to events and situations that could be expected in the day-to-day construction activities.

The information provided in Annex A represents situations that in probability, will not affect the project. However, these are presented as tools for developing a comprehensive loss prevention program.

Action Plans

A1. Windstorm Preparedness

A2. Hurricane Preparedness

A3. Earthquake Preparedness

A4. Freeze Protection

A5. Flood Preparedness

A6. Wildfire Preparedness

A7. Utility Outages

A8. Bomb Threats

A9. Civil Unrest

A10. HazMat Incident

A1. Windstorm Preparedness

Statement of issue

Windstorm damage typically accompanies severe thunderstorms, some are predictable and others such as wind shear are not.

Wind shear is a meteorological phenomenon occurring over a very small distance and is a significant (often violent) difference in wind speed and direction.

Preparation for a tornado must be done far in advance since there is usually little time to prepare for an approaching tornado. A sample Windstorm Preparedness checklist may be found in Annex B.

Windstorm advisories in the form of watches and warnings are issued by the National Weather Service. This information can be automatically 'alerted' to certain smartphones using apps from "AccuWeather" or "The Weather Channel".

A **tornado watch** implies that conditions are favorable for tornadoes to develop.
A **tornado warning** means that tornadoes have been sighted in the area.

Action Plan:

When a tornado **watch** has been issued:

- Alert all workers that a tornado watch has been issued.
- Activate the emergency operations center.
- Identify or design storm-safe worker shelter and assembly areas.
- If real-time severe weather information is not available, assign personnel equipped with two-way radios to watch for funnel cloud formation, to alert the emergency operations center of its characteristics and travel.

When a tornado **warning** has been issued, or a funnel-cloud sighted, alert all workers to immediately move to designated storm-safe areas.

Once the tornado has passed:

- Verify that all personnel are accounted for.
- Conduct a damage assessment. Pay special attention to possible fire, flooding, or impairment of fire protection equipment
- Begin temporary repairs to prevent further damage. Temporarily cover openings in the building or cover the contents of the building with tarpaulins to minimize rain damage.
- Exercise care around damaged power lines. Advise the utility company of necessary repairs.
- Clear roof drains of debris to prevent water from ponding on the roofs, which could lead to roof collapse.
- Prevent the use of any flame- or heat-producing equipment in any area where the presence of any flammable liquids or gases is suspected.

A2. Hurricane Preparedness

Statement of issue

Hurricane advisories in the form of hurricane watches and hurricane warnings are issued by the National Weather Service's National Hurricane Center in Miami, Florida.

A hurricane **watch** is an advisory that hurricane conditions pose a possible threat to a specified area within 36 hours.
A hurricane **warning** is a an advisory that sustained winds of 74 mph or higher are expected in a specified area within 24 hours.

Category	Sustained Winds	Storm Surge	Damage
1	74-95 mph	4-5 ft above normal	Minor
2	96-110 mph	6-8 ft above normal	Moderate
3	111-130 mph	9-12 ft above normal	Major
4	131-155 mph	13-18 ft above normal	Severe
5	Above 155 mph	>18 ft above normal	Catastrophic

The primary threats these weather systems represent are:

- Wind speeds exceeding 74 mph.
- Coastal flooding due to the storm surge.
- Inland flooding resulting from heavy rains that are usually part of the weather system.
- Weather conditions that can lead to tornadoes.

Preparedness. While these types of weather systems can cause great damage, they can be monitored and predicted usually hours and possibly days in advance. Use a detailed checklist to plan for these weather systems.

The planning scenario needs to determine when the "zero hour" is (typically when mandatory evacuation is ordered), what tasks need to be accomplished and the time required. The action plan is developed where each task can be chronologically and sequentially completed within the available time.

Consideration must be given to which workers will be available to perform these tasks and which workers will need to be released to attend to their own family's emergency preparedness.

A sample Hurricane Preparedness checklist and may be found in Annex B.

Hurricane Preparedness - Continued

Action Plan

(Hurricane preparation should begin once a hurricane **watch** has been issued.)

- Activate the emergency operations center.
- Identify materials scheduled for delivery in next few days and arrange for postponed delivery.
- Determine whether a complete or partial shutdown of the facility is warranted.
- Determine the order in which operations are to be shut down and the facility secured. Include the personnel necessary and time required to accomplish these tasks.
- Ensure contact information is available for key persons and for loss mitigation services.
- Inspect roofs:
    - Clear debris and unrestrained materials from roofs.
    - Expedite any work if the roof cover can be completed early; otherwise, provide coverings as practical on any opening.
- Inspect yard:
    - Fill all aboveground tanks to capacity with product or water. Any portable tanks should be removed.
    - Anchor structures in the yard that can be moved by high winds, such as trailers, cranes, lumber, or any loose yard storage. Lightweight materials (i.e. insulation) should be relocated indoors.
    - Clean yard drains and catch basins.
    - Arrange for the removal of the Dumpsters.
- Provide covering (plywood) on window and door openings.
- Protect windows from flying debris.
- Brace unsupported structural members at construction sites.
- Move important records to locations protected from wind, debris, and rain.
- Back up computers.
- Protect electronic devices (computers, printers, phone systems, etc.) in plastic bags.
- Prepare cranes per the manufacturer's guidelines.
- Fill the fuel tanks of emergency equipment such as back-up generators and diesel- driven fire pumps.
- Remove any materials from subgrade (basement) storage areas.

A3. Earthquake Preparedness

Statement of issue

Experience has demonstrated that earthquakes can be the one of the most disastrous emergencies based on their consequences and their unpredictability. The key to surviving an earthquake is anticipation and preparedness.

The basic concerns are:

- General panic and confusion
- Structural damage or collapse
- Entrapment of people
- Disruption of utilities
- Loss of public fire protection water supplies
- Reduction or total loss of outside emergency response services
- A high likelihood of fire caused by the quaking
- A high likelihood that the facility will have to survive on its own emergency resources for what may be an extended period of time

Action Plan

- Identify or design safe worker shelter and assembly areas. Designate both primary and secondary shelter and assembly areas as well as "duck," "cover," and "hold" locations along evacuation routes.
- Provide earthquake survival training to all workers.
- Ensure that one person in each department on each shift is trained and capable of taking charge of their work groups immediately when an earthquake occurs.
- Ensure that all plant personnel are involved in all facets of earthquake response and are drilled in properly reacting when an event occurs.
- Provide an emergency communications system of portable two-way radios for use in communicating with the emergency operations center following an earthquake.
- Assign specific duties and responsibilities for:
  - Accounting for personnel
  - Checking for injuries
  - Building damage assessment
  - Checking for fire and fire hazards
  - Checking for leaking gas or flammable/hazardous materials
  - Safe equipment shutdown
  - Shutting off fuel lines
  - Disconnecting power
  - Dealing with hazardous materials

When an earthquake occurs:

- Have workers evacuate the facility, shutting down hazardous operations as they evacuate.
- Have workers report to their pre-assigned areas to ensure all personnel are accounted for.

Earthquake Preparedness - Continued

After the earthquake:

- Activate the emergency operations center
- Notify your insurance agent.
- Anticipate aftershocks - they are frequently as dangerous as the initial earthquake.
- Assign a reconnaissance team(s) to conduct a primary search of the facility.
- Shut off all power and isolate hazardous liquids and gases.
- Attempt to control or extinguish any fires.
- Establish a communications link with local emergency management authorities.
  - Advise them of conditions at the facility.
  - Alert them to the need for emergency assistance.
- Establish communications with neighboring businesses.
- Determine the extent and severity of the damage. Be especially alert for the potential for fire.
- Exercise care around damaged power lines. Advise the utility company of necessary repairs.
- Assess the damage sustained to utilities in order to formulate and initiate a recovery plan.
- Initiate property conservation procedures.
- Keep nonemergency personnel out of structures until the extent of the damage has been thoroughly assessed.
- Secure the property from looting and vandalism. Get outside assistance as needed.
- Establish an emergency transportation pool. Do not attempt transportation beyond the local premises until accessibility is known.

A sample Earthquake Preparedness checklist can be found in Annex B.

A4. Freeze Protection

Statement of issue

Cold weather presents loss exposure as above and these are expected northern climates. In southern climates, cold weather is not usually considered a factor and this lack of concern is becoming less justifiable. Loss experience indicates that shifts in the jet stream can cause bitterly cold Arctic air masses to press deeply into the warmer climes, with sustaining freezing temperatures for periods of a week or more. This phenomenon has been labeled "Arctic freeze."

Facilities located in all but tropical areas must give careful consideration to precautions against Cold Weather, Winter Storm and Arctic Freeze that must be taken each year before the cold weather season.

A **winter storm warning** implies that strong winds, heavy snow and/or icing is imminent. Freezing weather creates several concerns, which include:

- Freezing of automatic sprinkler protection and fire protection water supplies, leaving the facility without proper protection.
- Freezing of process piping.
- An increase in the likelihood of a fire due to the use of portable heating appliances or overworked heating systems.
- Possible overload of heating and freeze protection systems.
- Reduced natural gas pressure due to heavy demand or freezing of liquids in lines.
- Freezing of public water lines and sewers.
- Hazardous road conditions, which hamper emergency response and evacuations.
- Decreased accessibility to fire protection valves, hydrants, hose houses and fire pumps.
- Increased roof loading due to snow and ice build-up that may lead to structural collapse.
- Power failure due to ice build-up on power lines.

The planning scenario needs to determine when the "zero hour" is (typically when the forecasted low temperatures or winter storm begins), what tasks need to be accomplished and the time required and then develop the action plan where each task can be chronologically and sequentially completed within the available time.

Consideration must be given to which workers will be available to perform these tasks and which workers will need to be released to attend to their own family's emergency preparedness.

A sample Winter Preparedness checklist may be found in Annex B.

Freeze Protection - Continued

Cold Weather Action Plan:

- When forecasters predict Cold Weather, Winter Storm or an Arctic Freeze, activate the emergency operations center.
- Ensure that all doors, windows, skylights, ventilators, and other openings are weather- tight. Eliminate any unusual drafts created by winter storm winds.
- Check the entire heating system(s) and correct any problems. Ensure that all heating equipment controls are operating properly.
- Ensure that fuel supplies for heating systems are adequate.
- Maintain safe clearances between heating system components and combustible floors, walls, partitions, platforms, and contents.
- Drain hydronic air handling systems as needed.
- Install heat tracing tape on piping that is expected to freeze.
- Ensure that portable fire extinguishers located in cold areas are suitable for such locations.
- Arrange for a reliable source of portable heaters, heating blankets or other auxiliary or emergency anti-freezing devices.
- Anticipate utility outages. Arrange for emergency generators and other equipment as may be needed to assure continued functioning of heating systems, realizing that electric utility lines are frequent casualties of winter storms.
- Ensure that circulating hot water in boilers is not allowed to cool excessively because it can cause cracking or other damage to the boilers when they are started.
- Plan for snow removal services.
- Install snow fences and marker poles at fire hydrants and fire protection control valves.
- Establish tours of the facility to check for dangerous snow accumulations.
- Check all areas of the facility to be certain that sufficient heat is being maintained to prevent freezing of sprinkler systems, process equipment and piping and utility systems.

After the freeze:

- Once the temperatures begin to rise, inspect areas within the facility that were most likely to have suffered freeze damage.
- Look for any cracks or leaks in piping which could cause major damage when liquids are released when the pipes thaw. Be aware of each system's main control valves and isolation valves.
- Remove snow from roofs in areas subject to drifting, especially at the junctions of buildings with different roof heights.

A5. Flood Preparedness

Statement of issue

Flooding loss exposures can occur

1. Whenever water rises and overflows the land that normally confines it.
2. When rain water or subsurface water accumulates in normally dry subterranean areas (basements)
3. When storm water runoff from higher topography flows into a property.

Flooding can be:

- Sudden in the form of flash floods which occur because of extraordinarily heavy localized rain.
- Slow developing as rivers and streams swell and spill over their banks.
- Caused by the failure of a man-made containment such as a dam or a levee.
- Due to storm surges associated with hurricanes and tropical storms.
- Totally unexpected due to a failure of the groundwater exclusion system.

The National Weather Service issues advisories in the form of flood watches and flood warnings.

A **flood watch** implies that flood conditions are a real possibility but are not imminent.
A **flood warning** for a river implies that a flood is imminent or in progress upstream and that immediate precautions should be taken in your area.

Some basic concerns are:

- Undermining of foundations.
- Structural damage.
- Water damage to machinery and contents.
- Disruption of utilities.
- Increased potential for fire.

The planning scenario needs to determine when the "zero hour" is (typically when flood elevations are predicted to reach your facility), what tasks need to be accomplished and the time required and then develop the action plan where each task can be chronologically and sequentially completed within the available time.

Consideration must be given to which workers will be available to perform these tasks and which workers will need to be released to attend to their own family's emergency preparedness.

A sample Flood Preparedness checklist and may be found in Annex B.

Flood Preparedness - Continued

Action Plan

- Activate the emergency operations center.
- Maintain communications with local emergency management authorities.
- Monitor the Emergency Broadcast System and weather reports issued by the National Weather Service.
- Determine if the conditions warrant a partial or total facility shutdown.
- Determine the order to shut down processes and secure the facility.
- Ensure that the time allotted and necessary workers to accomplish pre-flood tasks is sufficient to allow them to be completed before flood waters approach.
- Move important machinery, stock and materials to higher, safe elevations
- Coat machinery that cannot be moved with oil of grease.
- Fill the fuel tanks of emergency equipment such as back-up generators and diesel-driven fire pumps.
- Check cranes and prepare them in accordance with the manufacturers' instructions.
- Clean yard drains and catch basins.
- Move vital records to a safe location. Back up computers. Protect electronic equipment (computers, printers, phone systems) in plastic bags.
- Brace unsupported structural members at construction sites.
- Anchor any yard items that could be moved by flood waters, such as trailers, lumber, or loose yard storage.
- Barricade critical outdoor equipment with sandbags to provide protection against floating debris.
- Ensure that all fire protection equipment is in service.
- Barricade vulnerable building openings with sandbags.
- Shut off all lines carrying flammable or combustible liquids or gases at their sources.
- Properly support any exposed piping.
- Relocate portable tanks to high ground. Make sure permanent above- and belowground tanks are properly anchored to prevent flotation.
- Extend vent lines on active tanks above the anticipated maximum water level.
- Shut down boiler and other fuel fired equipment.
- Shut off electrical power at the main building disconnect when building flooding is imminent.

A6. Wildfire Preparedness

Statement of issue

Congested urban areas, suburban sprawl, and aesthetics have pushed some commercial and residential development into areas classified as wildlands areas. This migration is known as the Wildland-Urban Interface, and it includes myriad issues – with wildfires being a considerable concern.

While advancements have been made in predicting, mitigating, and combating wildfires, factors such as widespread drought, hot weather, and strong winds, particularly in western USA, have increased both the frequency and severity of wildfires. Interestingly, much the fire behavior modeling does not account for flying embers or firebrands, which present more of a fire exposure to structures than the wildfire itself. These embers and firebrand can start fires as far as a mile from the actual wildfire footprint. They can even have a delayed reaction, where a structure fire can start nearly 8 hours after the wildfire has moved through an area.

This, coupled with the presumption that firefighting resources are stretched thin to combat the blaze, and the probability that water supplies are limited or depleted, requires projects in these areas to place some consideration towards limiting their exposure to this hazard.

Code Reference

International Code Council: The International Wildland-Urban Interface Code

NFPA 1: Fire Code

Action Plan

- Police the yard and eliminate debris. Ensure fire hydrants and access roads are accessible.
- Empty the dumpsters frequently; there should be no trash at the end of the working day.
- Inspect the roof and remove any debris. Make note of areas adjoining parapets, penthouses, chimneys, dormers, air handlers, etc. where wind-born embers may dwell.
- Inspect air filters exposed to outside air and replace them if they are laden with combustible dust.
- Keep all staged combustible materials 30 ft away from the structure.
- Provide fireproof coverings for exposed open-web trusses and joists.
- If after-hours surveillance employs electronic detection/alarms, supplement the electronic system with on-site security guard(s) serving more as a fire watch. The site should be toured continuously.
- Ensure adequate fire extinguishers are available.

A7. Utility Outages

Statement of issue

Planned or emergency interruption of utilities can create emergency conditions at facilities. Of primary concerns are:

- Public Water Supplies
  - Impairment or loss of fire protection water.
  - Partial or complete curtailment of operations due to loss of service water.
- Electric Power
  - Partial or complete curtailment of operations.
  - Brownout causing reduced power consumption.
- Fuel Supply
  - Partial or complete curtailment of operations.
  - Potential freezing of fire protection equipment.
- Impairment or loss of fire protection systems.
- Communications infrastructure failure (cell phone, direct-connect network, internet). This network may be a victim of the widespread disaster or it simply may be overwhelmed and unusable by the sheer volume of users during emergencies.

Action Plan

Public water supply outage:

- Contact officials of the water authority to determine:
  - The estimated extent and duration of the outage.
  - What is being done and what the facility can do to expedite repairs.
- Notify the facility's emergency response team(s) and the Shift Commander of the public fire department so they can alter their pre-fire plans accordingly.
- Ensure the safe shutdown, provide a backup, or closely monitor the operation of equipment that uses the public water supply for primary or emergency cooling.
- Verify sufficient boiler feedwater or arrange boiler load reduction or shutdown. If there is danger of freezing, promptly obtain another source of properly treated water.
- Develop a priority list for water usage should conservation of available supplies become necessary.
- Reserve all private fire protection water supplies for fire use only.
- Defer normal sprinkler and fire protection system testing and maintenance until the water supply is restored.
- Initiate Fire Protection Impairment Procedures if a fire protection impairment results.

Utility Outages Preparedness - Continued

Electric Power Outage

Widespread Outage

- Determine the magnitude of the outage and its estimated duration.
- Monitor the operation of fire pumps or emergency generators.
- See that increased guard patrols are provided for security and fire protection surveillance.
- Have as many circuits as possible disconnected so that the system will not overload when power is restored.
- If there are basement areas or if the work continues after dark, strategically spaced emergency lights should be provided.

Local Outage

- Determine the magnitude of the outage and its estimated duration.
- Make sure that affected circuits are properly isolated and that repairs are underway.
- Determine that all 'critical' equipment and systems protective signaling systems, fire pumps, and key process equipment receive priority treatment when planning restoration.
- Check to be sure that all circuits are properly repaired, including a test for correct phase relationship, before they are restored to service.
- Have the power load reduced to a minimum before power is restored. Also be certain that large motors are isolated to prevent damage due to possible under-voltage starting.
- If there are basement areas or if the work continues after dark, strategically spaced emergency lights should be provided.

Brownout

- Determine the magnitude of the brownout and its estimated duration.
- Reduce electrical consumption as much as possible.
- Identify equipment which may be sensitive to low voltage, and take positive steps to prevent its damage.
- Be alert to the possibility of a 'single-phase condition.' If this condition exists, shut down all three-phase electrical equipment until a balanced supply can be restored.

Communication Network Failure

- Determine which cell phones with "direct connect" feature are available/useable.
- Provide two-way radios.
- Establish a liaison with a local amateur radio operator (www.aarl.org).

A8. Bomb Threats

Statement of issue

Although history shows that most bomb threats turn out to be hoaxes, all bomb threats must be taken seriously.

Dealing with a bomb threat:

- Ensure telephone operators understand how to properly handle bomb threats and to:
- Obtain as much information as possible from the caller.
- Complete a Bomb Threat Checklist
- Attempt to find out how many devices are involved and when they are due to detonate.
- Immediately notify the appropriate personnel within the facility.
- Activate the emergency operations center.
- Instruct workers to report any suspicious package, action, or condition that would lead them to suspect a bomb's presence.
- Evacuate personnel from the affected area.
- Alert the appropriate law enforcement agencies. If no agencies are available, alert the appropriate Bomb Squad.
- Determine who will look for the bomb. Many public fire departments feel that their responsibility is to stand by should their services be needed and do not join the search.
- Identify likely places in which to hide a bomb.
- Alert local fire and emergency medical response agencies.

If a suspected bomb is discovered:

- Activate the Emergency Operations Center.
- Evacuate personnel.
- Alert the appropriate law enforcement agencies. If no law enforcement agencies are available, alert the appropriate Bomb Squad.
- Alert local fire and emergency medical response agencies.
- Have facility emergency response team(s) stand by in a safe location and prepare for emergency duties.

A bomb threat check list can be found in Appendix B.

Additional Resources:

http://www.popcenter.org/problems/bomb_threats/PDFs/planCanada.pdf

A9. Civil Disturbances

Statement of issue

Civil disturbances in the community where a facility is located can result in emergency conditions at the facility. They may include looting, rock throwing, localized vandalism, acts of pranksters, and actual acts of aggression.

A strike or other job action brought about because of labor unrest can present unique challenges to a facility and its ability to deal with emergencies. Not only may those involved in the labor unrest not be available to respond to or deal with emergencies, but they may also take actions that increase the likelihood of an emergency at the facility. An incident of this type can leave a facility critically short of staff and totally unable to deal with any emergency.

Civil Disturbances: Action Plan

- Activate the Emergency Operations Center.
- Alert local law enforcement agencies.
- Shut down the facility if required. Instruct workers to secure their work areas as they would for an extended holiday.
- Escort workers to their cars as necessary.
- Vehicles should be kept within the facility gates, if possible.
- Maintain accessibility for emergency vehicle response.
- Summon additional security personnel, if necessary, to maintain facility security.
- Secure utilities and fire protection equipment.
- Request special exterior patrols from local law enforcement officials.
- Secure and patrol all potential points of entry.
- Increase guard patrols to provide for security and fire protection surveillance.
- Inspect all fire protection valves and equipment to ensure they have not been sabotaged or intentionally impaired.

Labor Unrest: Action Plan

- Activate the Emergency Operations Center.
- Assess the need to stabilize or shut down the facility. The safest course of action may be to shut down the facility as soon as this can be accomplished safely.
- Alert local law enforcement agencies. Request special exterior patrols.
- Summon additional security personnel, if necessary, to maintain facility security.
- Tour the facility to look for any evidence of sabotage that may have been created by workers. Inspect all fire protection valves and equipment to ensure they have not been intentionally impaired.

A10. HazMat Incident

Statement of issue

Hazardous materials are any substances that may pose an unreasonable risk to health, safety or the environment.

The release of a hazardous material during normal facility operations, where the material can be absorbed, neutralized, or otherwise controlled by workers or maintenance personnel, usually does not require an emergency response because there is no potential safety or health hazards, such as fire, explosion, or chemical exposure.

A **hazardous materials emergency** involves a substance that is outside of or likely to leave its container and present a threat to human health, property, and/or the environment. This requires the response from HazMat Response Teams.

The Loss Prevention Program Manager should be trained to the Hazardous Materials Awareness Level. This will allow him/her identify a problem, protect him/herself, notify others who need to respond, and isolate an incident. Trained at the Awareness Level you are not to take direct action to try and stop a leak, clean up a spilled substance, or otherwise involve yourself directly with a hazardous material.

Action Plan

For personnel discovering a release which requires an emergency response:

- Initiate emergency reporting procedures
- Instruct workers to follow safe shut-down procedures in their assigned areas.
- Evacuate personnel in the incident area to a safe location.
- Deny personnel entry to the incident area.
- Assess the presence of hazardous materials from a safe distance, if possible, including:
- Container type, size and shape.
- Presence of placards or labels.
- Any signs of materials release.

Additional Resources:

http://energy.gov/sites/prod/flles/em/TEPP/2-b-2HazardousMaterialslncidentResponse.pdf

Annex B – Forms

These fill-in-the blank forms are reproducible and can be used as guidance in preparing your loss prevention programs.

B1. Hurricane Preparedness

B2. Windstorm Preparedness

B3. Earthquake Preparedness

B4. Freeze Protection Checklist

B5. Bomb Threat

B6. Flood Preparedness

B7. Self-Inspection

B8. Training Record

B9. Emergency Operations Center Checklist

B10. Hot Work Permit – English

B11. Hot Work Permit - Spanish

B12. Shelter-in-Place Site Preparedness Checklist

B13. Security Modification Request Form

B14. Impairment Permit

B1. Hurricane Preparedness

(Hurricane preparation should begin once a hurricane has been issued.)

TASK	TIME NEEDED	START WHEN?	ASSIGNED TO	COMPLETED
Activate the emergency operations center				
Shut off fuel supplies and power at main disconnect.				
Determine whether to do a complete or partial shutdown				
Determine the order in which operations are to be shut down				
Determine the personnel necessary for these tasks.				
Provide covering (plywood) on window and door openings.				
Photograph and/or video the property.				
Brace unsupported structural members at construction sites.				
Move important records to safe locations. Back-up computers.				
Prepare cranes per the manufacturer's guidelines.				
Fill the fuel tanks of emergency equipment (generators).				
Remove any materials from subgrade (basement) areas				
INSPECT ROOFS:				
• Clear debris and unrestrained materials				
• Expedite work if the roof canbe completedearly.				
• Otherwise, provide coverings as practical on any opening				
INSPECT YARD:				
• Arrange for having the dumpster emptied.				
• Any portable tanks should be removed.				
• Ensure tarpaulins or product wrappers are secure.				
• Relocate yard equipment and vehicles to high ground.				
• Anchor materials (lumber) that can be moved by winds				
• Light materials (insulation) should be relocated indoors.				
• Clean yard drains and catch basins.				

B2. Windstorm Preparedness

When a tornado watch has been issued:

TASK	ASSIGNED TO:	COMPLETED
Alert all employees that a tornado watch has been issued.		
Activate the emergency operations center.		
Identify or design safe worker shelter and assembly areas.		
If real-time severe weather information is not available, assign personnel equipped with two-way radios to watch for funnel cloud formation, to alert the emergency operations center of its characteristics and travel.		

When a tornado warning has been issued, or a funnel-cloud sighted, alert all employees to immediately move to designated storm-safe areas.

Once the tornado has passed:

TASK	ASSIGNED TO	COMPLETED
Verify that all personnel are accounted for.		
Notify your insurance agent immediately.		
Initiate property conservation procedures.		
Conduct a damage assessment.		
Begin temporary repairs to prevent further damage.		
Pay special attention to possible fire, flooding, or impairment of fire protection equipment.		
Cover openings in the building or cover the contents of the building with tarpaulins to minimize rain damage.		
Exercise care around damaged power lines. Advise the utility company of necessary repairs.		
Clear roof drains of debris to prevent water from ponding on the roofs		
Forbid the use of any flame- or heat- producing equipment in any area where the presence of any flammable liquids or gases is suspected.		

B3. Earthquake Preparedness

Base this program on the premise that an earthquake will eventually occur without warning.

TASK	IMPLEMENTED
Identify or design safe employee shelter and assembly areas.	
Designate both primary and secondary evacuation routes	
Provide earthquake survival training to all workers.	
Ensure that one person in each department on each shift is trained and capable of taking charge of their work groups immediately when an earthquake occurs.	
Ensure that all plant personnel are involved in all facets of earthquake response and are drilled in properly reacting when an event occurs.	
Provide an emergency communications system of portable two-way radios for use in communicating with the emergency operations center following an earthquake.	
Assign specific duties and responsibilities for:	
• Accounting for personnel.	
• Checking for injuries.	
• Building damage assessment.	
• Checking for fire and fire hazards.	
• Checking for leaking gas or flammable/hazardous materials.	
• Safe equipment shutdown.	
• Shutting off fuel lines	
• Disconnecting power.	
• Dealing with hazardous materials.	

AFTER THE EARTHQUAKE:

Anticipate aftershocks - they are frequently as dangerous as the initial earthquake

TASK	IMPLEMENTED
Assign a reconnaissance team(s) to conduct a primary search of the facility – if this can be accomplished safely	
Shut off all power and isolate hazardous liquids and gases.	
Establish a communications link with local emergency management authorities.	
• Advise them of conditions at the facility.	
• Alert them to the need for emergency assistance.	
Determine the extent and severity of the damage. Be especially alert for the potential for fire and downed power lines.	
Assess the damage sustained to utilities in order to formulate and initiate a recovery plan.	
Initiate property conservation procedures.	
Keep nonemergency personnel out of structures until the extent of the damage has been thoroughly assessed.	
Secure the property from looting and vandalism. Get outside assistance as needed.	
Establish an emergency transportation pool. Do not attempt transportation beyond the local premises until accessibility is known.	

B4. Freeze Protection Checklist

When a Freezing Weather Warning Has Been Issued:

TASK	TIME NEEDED	START WHEN	ASSIGNED TO	COMPLETED
Activate the emergency operations center.				
Ensure that all doors, windows, and other openings are weather-tight.				
Maintain at least 40o F in areas protected by wet-pipe fire sprinklers.				
Check the entire heating system(s) and correct any problems.				
Ensure that fuel supplies for heating systems are adequate.				
Inspect for clearances between heating system and combustibles.				
Drain air conditioning and hydronic HVAC systems as needed.				
Install heat tracing tape on piping that is expected to freeze.				
Ensure that fire extinguishers located in cold areas are suitable.				
Arrange for a reliable source of portable heaters.				
Arrange for emergency generators to assure continued functioning of heating systems.				
Plan for snow removal services.				
Install snow fences and marker poles at fire hydrants and control valves.				
Establish tours of the facility to check for dangerous snow accumulations.				
Check all areas of the facility to ensure sufficient heat is being maintained to prevent freezing of sprinkler systems, process equipment, piping and utility systems.				

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B5. Bomb Threats

BOMB THREAT PROCEDURES

This quick reference checklist is designed to help employees and decision makers of commercial facilities, schools, etc. respond to a bomb threat in an orderly and controlled manner with the first responders and other stakeholders.

Most bomb threats are received by phone. Bomb threats are serious until proven otherwise. Act quickly, but remain calm and obtain information with the checklist on the reverse of this card.

If a bomb threat is received by phone:

1. Remain calm. Keep the caller on the line for as long as possible. DO NOT HANG UP, even if the caller does.
2. Listen carefully. Be polite and showinterest.
3. Try to keep the caller talking to learn more information.
4. If possible, write a note to a colleague to call the authorities or, as soon as the caller hangs up, immediately notify them yourself.
5. If your phone has a display, copy thenumber and/or letters on the window display.
6. Complete the Bomb Threat Checklist immediately. Write down as much detail as you can remember. Try to get exact words.
7. Immediately upon termination of call, DO NOT HANG UP, but from a different phone, contact authorities immediately with information and await instructions.

If a bomb threat is received by handwritten note:

- Call _____
- Handle note as minimally as possible.

If a bomb threat is received by email:

- Call _____
- Do not delete the message.

Signs of a suspicious package:

- No return address
- No excessive postage
- Stains
- Strange odor
- Strange sounds
- Unexpected delivery
- Poorly handwritten
- Misspelled words
- Incorrect titles
- Foreign postage
- Restrictive notes like?

Refer to your local bomb threat emergency response plan for evacuation criteria

DO NOT:

- Use two-way radios or cellular phone. Radio signals have the potential to detonate a bomb.
- Touch or move a suspicious package.

WHO TO CONTACT (Select One)

- **911**
- **Follow your local guidelines**

For more information about this form contact the Office for Bombing Prevention at:
OBP@cisa.dhs.gov

BOMB THREAT CHECKLIST

DATE: **TIME:**

TIME CALLER HUNG UP: **PHONE NUMBER WHERE CALL RECEIVED:**

Ask Caller:

- Where is the bomb located? (building, floor, room, etc.)
- When will it go off?
- What does it look like?
- What kind of bomb is it?
- What will make it explode?
- Did you place the bomb? Yes No
- Why?
- What is your name?

Exact Words of Threat:

Information About Caller:

- Where is the caller located? (background/level of noise)
- Estimated age:
- Is voice familiar? If so, who does it sound like?
- Other points:

Caller's Voice	Background Sounds	Threat Language
☐ **Female**	☐ Animal noises	☐ Incoherent
☐ **Male**	☐ House noises	☐ Message read
☐ Accent	☐ Kitchen noises	☐ Taped message
☐ Angry	☐ Street noises	☐ Irrational
☐ Calm	☐ Booth	☐ Profane
☐ Clearing throat	☐ PA system	☐ Well-spoken
☐ Coughing	☐ Conversation	
☐ Cracking Voice	☐ Music	
☐ Crying	☐ Motor	
☐ Deep	☐ Clear	
☐ Deep breathing	☐ Static	
☐ Disguised	☐ Office machinery	
☐ Distinct	☐ Factory machinery	
☐ Excited	☐ Local	
☐ Laughter	☐ Long distance	
☐ Lisp		
☐ Loud		
☐ Nasal		
☐ Normal		
☐ Ragged		
☐ Rapid		
☐ Raspy		
☐ Slow		
☐ Slurred		
☐ Soft		
☐ Stutter		

OTHER INFORMATION:

B6. Flood Preparedness

When a Flood Watch has been issued:

TASK	TIME NEEDED	START WHEN	ASSIGNED TO	COMPLETED
Activate the emergency operations center				
Determine whether to do a complete or partial shutdown				
Determine the order in which operations are to shut down				
Determine the personnel necessary for these tasks.				
Coat machinery that cannot be moved with oil of grease				
Brace unsupported structural members.				
Move important records to safe locations. Back-up computers.				
Prepare cranes per the manufacturer's guidelines.				
Fill the fuel tanks of emergency equipment (generators).				
Remove any materials from subgrade (basement) areas				
Barricade vulnerable building openings with sandbags.				
Shut off flammable liquids or gases at sources				
Properly support any exposed piping.				
Arrange for having the dumpster emptied.				
Shut down boiler and other fuel fired equipment at source.				
Shut off electrical power at the main building disconnect.				
INSPECT YARD:				
Fill all aboveground tanks to capacity with product or water.				
Any portable tanks should be removed.				
Clean yard drains and catch basins.				
Photograph and/or video the property.				
Anchor supplies of building materials				
Relocate yard equipment and vehicles to high ground.				

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B7. Self-Inspection

LOSS PREVENTION INSPECTION To be performed weekly.			Date:
HAZARD	**PASS**	**FAIL**	**ASSIGNED TO**
Hot Work			
Are permits used			
Are extinguishers available			
Is fire watch assigned			
Does fire watch only observe hot work			
Smoking			
Are Signs posted			
Permitted area combustible free			
Are receptacles provided			
Visitors aware of no-smoking			
Electrical			
Are extension cords correct size			
Branch circuits feed approved			
Temporary wiring inspected			
Are GFI used			
Is only one appliance per cord			
Are lights clear of combustibles			
Engine Driven Equipment			
Maintenance done away from building			
Fire Extinguisher on equipment			
Engines cool before refueling			
Fuel Hazard			
Fuel > 60 gal. more than 50’ away			
No engines or fuel indoors			
No engines / fuel on combustibles			
Engines or fuel > 10’ away from bldg.			
Fuel Storage = No Smoking			
Fuel storage have extinguisher			
Heating Appliances			
Inspected OK			
Approved heaters used			
Kept clear of combustibles			
Tip-over device used			
Housekeeping			
Acceptable level understood by all			
Adequate removal of trash			
Adequate cleaning schedule			

B7. Self-Inspection Continued

HAZARD	PASS	FAIL	ASSIGNED TO
Material Handling			
Yard storage > 30’ away			
Materials arranged neatly			
Materials do not block exits			
Sprinklers in service at storage			
Debris Removal			
Dumpster > 10’ away			
Dumpster change schedule adequate			
Trash chute has fire sprinkler			
Trash chute has fire safety plan			
Site Access			
Roads kept clear parking / storage			
Central location for keys, maps etc.			
Interior Access			
All levels have one usable stairs			
Manual Fire Protection			
Fire extinguishers < 75’ travel			
One fire extinguisher at each stair			
All units inspected			
Standpipes in service			
Hydrants/Water Supply			
Are hydrants available/in service			
Hydrants accessible			
Suppression Systems			
Fire sprinklers in service yet?			
Passive fire protection features			
Fire caulk installer factory trained			
Fire rated construction inspected			
Fire doors kept clear and operable			
Physical Security			
Is perimeter fence intact			
Perimeter has unobstructed views			
Lighting provided so no shadows			
Personnel Security			
Is there unambiguous notification			
Is there storm-safe area			
Is there an assembly area			

B7. Self-Inspection Continued

HAZARD	PASS	FAIL	ASSIGNED TO
Roofing Operations			
Fire extinguishers available			
Tar kettle at ground level			
Tar kettle constantly attended			
Heat seam torches inspected			
Two hour fire watch after roofing			
Pipe Leakage			
Location zone and shut-offs known			
Control valves kept accessible			
Relief valve discharge to a safe area			
Inspected by:			
Reviewed by:			
Work Orders Prepared			

B8. Training Record

LOSS PREVENTION PREPAREDNESS TRAINING RECORD	
Topic:	Date:
Presenter:	Time:
Attendee Sign In:	

B9. Emergency Operations Center Checklist

TASK	ASSIGNED TO:	COMPLETED:
Post signs so everyone knows about the Emergency Operations Center; location and how to contact it.		
Liason with emergency responders; emergency Operations Center location and who the contact(s) are.		
Post emergency contact info: Loss Prevention Program Manager, Key Players, Emergency Responders		
Provide writing material to keep log of events and communications. Make notes on every conversation.		
Arrange for charging of radios and cell phones assuming power outage.		
Provide battery powered radio for keeping informed of news and events. (Presume internet is down.)		
Establish 'phone tree' so key people are kept appraised of developments. Verify contact info is accurate.		
Establish roster of workers with limited English proficiency or impairments requiring assistance.		
ASSEMBLE EMERGENCY SUPPLIES:		
• Emergency lighting equipment		
• Flashlights and Extra Batteries		
• Spray paint (for marking)		
• Barrier Tape		
• Crow bar/wrecking bar		
• Fire extinguisher		
• Rope, ratchet tie-downs, come-along (hand winch)		
• Flat tire repair kit		
• $1000 cash		
• Power and hand tools, shovels and axes		
• Cameras and/or video recording equipment		
• Chain saws (with appropriate fuel mix)		
• Portable Generator (with fuel)		
• Extension power cords		
• Tarpaulins		
• Emergency medical equipment		
• Nonperishable food		
• Bottled drinking water		
• Portable pumps and hose		
• Mops and squeegees		

B10. Hot Work Permit – English Version

No hot work shall be performed until the scope of the hazard and the precautions necessary have been evaluated by the Permit Authorizing Individual and this permit has been issued.

Date:	**Permit Checklist**	
Building:	OK	Flammable and combustible materials within a 35' radius of hot work have been removed or covered with fire retardant tarps or metal shields.
Location:		
Name of Operator:		All floors and surfaces within a 35' radius of the hot work area have been swept free of combustible dust or debris.
Company:		
Description of Work:		Any opening or cracks in the walls, floors, or ducts that are potential travel passages for sparks, heat and flames have been covered.
Permit Expires (Same Day as Issued):		Appropriate PPE available (helmet, eye protection, gloves, appropriate clothing and footwear, and respirator.)
Is Fire Watch required: YES NO		
A fire watch should be posted if: Combustible materials within a 35 ft. radius of hot work cannot be removed. Wall or floor openings within a 35' radius of hot work expose combustible materials in adjacent areas, including concealed spaces in walls orfloors. Combustible materials are adjacent to the opposite side of partitions, walls ceilings or roofs and are likely to be ignited. It is deemed necessary by the Permit Authorizing Individual.		Equipment has been inspected and is in good condition?
		An operable fire extinguisher is nearby and accessible?
		Operators have access to two-way communication (radio, cell phone)?
		Fire alarm service notified and smoke detectors in area have been covered?
		Workers in adjoining areas advised of Hot Work?
		Persons assigned fire watch do not have other duties.
		Appropriate warning signage provided.
		Equipment not to be used near flammable vapors or liquids
	Select One of the Options Below for Fire Watch	
		Fire watch remains for the duration of the project and for at least 60 minutes after the work is completed (120 minutes if Roof)
		The Fire Watch remains for at least 30 minutes (60 minutes if Roof) and is dismissed after entire hot work area is checked with a Thermal Imaging Camera.

Authorization: By signing this section, the Permit Authorizing Individual has reviewed the information on this permit has been evaluated and the hot work area has been examined to ensure all safety measures are in place.

Permit Authorizing Individual's Signature: _____

Permit Sign-Out: By signing this section, the Permit Authorization Individual confirms the hot work area does not pose as a fire hazard; having undergone an appropriate fire watch duration and (optionally) verified as "cooled off" through use of a Thermal Imaging Camera.

Permit Authorizing Individual's Signature: _____

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B11. Hot Work Permit – Spanish Version

No se realizara ningún trabajo de soldadura hasta que el alcance del peligro y las precauciones necesarias hayan sido evaluados por la persona que autoriza el permiso y se haya expedido este permiso.

Fecha:	**Lista de control de permisos**	
Edificio:	OK	Los materiales inflamables y combustibles en un radio de 35 pies del trabajo de soldadura han sido retirados o cubiertos con lonas ignífugas o escudos metálicos.
Ubicación:		
Nombre del operador:		Todos los suelos y superficies en un radio de 35' de la zona de trabajo de soldadura han sido barridos y están libres de polvo o residuos combustibles.
Compañía:		
Descripción de los trabajos:		Se han tapado todas las aberturas o grietas de las paredes, suelos o conductos que sean posibles vías de paso de chispas, calor y llamas.
Expiración del permiso (el mismo día que el emitido):		Equipo de protección individual adecuado disponible. (casco, protección ocular, guantes, ropa y calzado adecuados y respirador).
Es necesaria la vigilancia de incendios: SÍ NO		
Se debe establecer una vigilancia de incendios si: No se puede eliminar los materiales combustibles en un radio de 35 pies de trabajo de soldadura. Las aberturas en paredes o suelos en un radio de 35 pies del trabajo en cliente exponen materiales conbustibles en zonas adyacentes, incuildos espacios ocultos en paredes o suelos. Los materiales combustibles se encuentran junto al lado opuesto de tabiques, paredes, techos, o tejados y pueden inflamarse. La persona que autoriza el permiso lo considere necesario.		¿Se ha inspeccionado el equipo y está en buenas condiciones?
		¿Hay un extintor de incendios operativo cerca y accesible?
		¿Los operadores tienen acceso a comunicación bidireccional (radio, teléfono móvil)?
		¿Se ha notificado el servicio de alarma contra incendios y se han cubierto los detectores de humo de la zonahumo de la zona?
		¿Se ha avisado a los trabajadores de las zonas colindantes de los trabajos de soldadura?
		Las personas asignadas a la vigilancia de incendios no tienen otras obligaciones.
		Señalización adecuada ha sido proporcionada
		Equipo que no debe utilizarse cerca de vapores o líquidos inflamables
	Seleccione una para la vigilancia de incendios	
		La Guardia de Incendios se mantiene durante toda la duración del proyecto y durante al menos 60 minutos una vez finalizados los trabajos (120 minutos si se trata de un tejado).
		La Guardia de Incendios permanece durante al menos 30 minutos (60 minutos si se trata de un tejado) y se retira después de que se haya comprobado toda la zona de trabajo de soldadura con una cámara termográfica.

Autorización: Al firmar esta sección, el Individuo que Autoriza el Permiso ha revisado la información de este permiso ha sido evaluada y el área de trabajo de soldadura ha sido examinada para asegurar que todas las medidas de seguridad están en su lugar.

Firma de la persona que autoriza el permiso:_____

Firma del Permiso: Al firmar esta sección, la persona que autoriza el permiso confirma que el área de trabajo de soldadura no representa un peligro de incendio, que se ha sometido a una vigilancia contra incendios de duración adecuada y (opcionalmente) que se ha verificado que está "enfriada" mediante el uso de una cámara termográfica.

Firma de la persona que autoriza el permiso:_____

B12. Shelter-in-Place Site Preparedness Checklist

TASK	TIME NEEDED	START WHEN?	ASSIGNED TO	COMPLETED
Shut off fuel supplies and power at main disconnect.				
Determine whether to do a complete or partial shutdown				
Determine the order in which operations are to be shut down				
Determine the personnel necessary for these tasks.				
Provide covering (plywood) on window and door openings.				
Photograph and/or video the property.				
Brace unsupported structural members at construction sites.				
Move important records to safe locations. Back-up computers.				
Prepare cranes per the manufacturer's guidelines.				
Remove any materials from subgrade (basement) areas				
INSPECT ROOFS:				
• Clear debris and unrestrained materials				
• Expedite work if the roof can be completed early				
• Provide coverings as practical on any opening				
INSPECT YARD:				
• Arrange for having the dumpster emptied.				
• Any portable fuel tanks should be removed.				
• Ensure tarpaulins or product wrappers are secure.				
• Relocate yard equipment and vehicles to securable areas above grade.				
• Anchor materials that can be moved by winds				
• Light materials (insulation) should be relocated indoors.				
• Clean yard drains and catch basins.				

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B12. Shelter-in-Place Site Preparedness Checklist - Continued

SHELTER-IN-PLACE INSPECTION			Date:
HAZARD	**PASS**	**FAIL**	**ASSIGNED TO:**
Hot Work			
All Tasks have been completed with satisfactory fire watch duration or suspended.			
Electrical			
Are extension cords removed or secured			
Temporary wiring taken down or secured			
Electrical Appliances removed or secured			
Engine Driven Equipment			
Equipment removed or secured			
Fuel drained if secured on site			
Fuel Hazards			
Fuel removed from site			
Heating Appliances			
Temp heating deactivated or AHJ approval for use with personnel on-site monitoring			
Approved heaters used			
Kept clear of combustibles			
Tip-over device used			
Housekeeping			
Removed all combustible trash from site			
Material handling			
Yard storage secured			
Materials arranged neatly			
Materials do not block exits			
Sprinklers in service (if applicable)			

B12. Shelter-in-Place Site Preparedness Checklist - Continued

SHELTER-IN-PLACE INSPECTION			Date:
HAZARD	**PASS**	**FAIL**	**ASSIGNED TO:**
Debris removal			
Dumpsters cleared out			
Dumpsters removed or secured			
Trash chute taken down (if applicable)			
Site Access			
Roads kept clear parking / storage			
Interior Access			
All levels have one usable stairs			
Manual fire protection			
Fire extinguishers < 75' travel			
One fire extinguisher at each stair			
All units inspected			
Standpipes in service			
Hydrants/Water Supply			
Are hydrants available/in service			
Hydrants accessible			
Suppression Systems			
Fire sprinklers in service yet?			
Passive fire protection features			
Fire doors kept clear & operable			
Physical Security			
Is perimeter fence intact			
Perimeter has unobstructed views			
Lighting provided so no shadows			

HAZARD	PASS	FAIL	ASSIGNED TO:
Roofing Operations			
Roofing Materials relocated and secured			
Tar kettle at ground level and secured			
Pipe Leakage			
Domestic Supply turned off			
Fire Supply turned off (if site has freezing potential and cannot operate temp heating with personnel monitoring equipment)			
Inspected by:			
Reviewed by:			
Work Orders Prepared			

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B13. Security Modification Request Form

Thank you for reaching out to the US Assure E&S loss prevention team. We will consider your request officially received when you return:

1. This form with questions answered
2. Site plan illustrating
    a. List of buildings being turned over
    b. Fence diagram
    c. Camera layout modification

Questions:

1. Site Name: _____
2. Point of Contact's Name: _____
3. What is the reason that security should be modified on this site?

4. Date of Request _____
5. Is the fire suppression system activated? ☐ Yes ☐ No
6. Is the building alarm System activated? ☐ Yes ☐ No
7. What date does occupancy commence? _____
8. Have you reached out to the security vendor yet? ☐ Yes ☐ No
9. Who did you speak to? _____
10. When is the project receiving its final certificate of occupancy? _____
11. Do you have or are you planning on having a guard / watchperson on this site? ☐ Yes ☐ No
12. Watchperson vendor name: _____
13. Are there any additional security measures that have been implemented that are not mentioned above?

14. Provide the total number of buildings on site: _____

Complete the addendum below if there is more than one building. Include accurate information by building number.

Building Number	1	2	3
1. Building Name			
2. Is the roof complete and weather sealed?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
3. If not, what is the scheduled date?			
4. Are all windows / doors installed and weather sealed?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
5. Is the façade complete and weather sealed?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
6. If not, what is the scheduled date?			
7. Has drywall or other interior finish commenced?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
8. If not, what is the scheduled date?			
9. Date Temporary Certificate of Occupancy was issued			
10. If not, what is the scheduled date?			
11. Date Final Certificate of Occupancy is scheduled to be issued			
12. If not, what is the scheduled date?			
13. Date Occupancy first occurred			
14. If not, what is the scheduled date?			
15. Percent Occupied (if applicable)			
16. Is the Sprinkler System charged and operational?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
17. If not, what is the scheduled date			
18. Is the Central Alarm active and in operation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
19. If not, what is the scheduled date			
20. Is the Fire Alarm System active and in operation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
21. If not, what is the scheduled date			
22. Are there any other enforce property policies for this building?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

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Building Number	1	2	3
23. Building Name			
24. Is the roof complete and weather sealed?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
25. If not, what is the scheduled date?			
26. Are all windows / doors installed and weather sealed?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
27. Is the façade complete and weather sealed?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
28. If not, what is the scheduled date?			
29. Has drywall or other interior finish commenced?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
30. If not, what is the scheduled date?			
31. Date Temporary Certificate of Occupancy was issued			
32. If not, what is the scheduled date?			
33. Date Final Certificate of Occupancy is scheduled to be issued			
34. If not, what is the scheduled date?			
35. Date Occupancy first occurred			
36. If not, what is the scheduled date?			
37. Percent Occupied (if applicable)			
38. Is the Sprinkler System charged and operational?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
39. If not, what is the scheduled date			
40. Is the Central Alarm active and in operation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
41. If not, what is the scheduled date			
42. Is the Fire Alarm System active and in operation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
43. If not, what is the scheduled date			
44. Are there any other enforce property policies for this building?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Building Number	1	2	3
45. Building Name			
46. Is the roof complete and weather sealed?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
47. If not, what is the scheduled date?			
48. Are all windows / doors installed and weather sealed?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
49. Is the façade complete and weather sealed?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
50. If not, what is the scheduled date?			
51. Has drywall or other interior finish commenced?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
52. If not, what is the scheduled date?			
53. Date Temporary Certificate of Occupancy was issued			
54. If not, what is the scheduled date?			
55. Date Final Certificate of Occupancy is scheduled to be issued			
56. If not, what is the scheduled date?			
57. Date Occupancy first occurred			
58. If not, what is the scheduled date?			
59. Percent Occupied (if applicable)			
60. Is the Sprinkler System charged and operational?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
61. If not, what is the scheduled date			
62. Is the Central Alarm active and in operation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
63. If not, what is the scheduled date			
64. Is the Fire Alarm System active and in operation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
65. If not, what is the scheduled date			
66. Are there any other enforce property policies for this building?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

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B14. Impairment Permit

FIRE PROTECTION SHUT OFF ATTACH TO IMPAIRED SYSTEM	
System:	Date:
Area:	Time:
Cause:	Expected Restoration:
System Shut-off By:	
Precautions:	
Insurance Company Notified:	
Alarm Service Notified:	
Fire Department Notified:	
Hazardous Operations Stopped:	
No Smoking:	
Restoration Efforts Continuous:	
System Restored By:	
Date:	Time:
System verification (such as by drain test)	

FIRE PROTECTION IMPAIRED REMINDER	
System:	Date:
Area:	Time:
Cause:	Expected Restoration:
System Shut-off By:	
Precautions:	
Insurance Company Notified:	
Alarm Service Notified:	
Fire Department Notified:	
Hazardous Operations Stopped:	
No Smoking:	
Restoration Efforts Continuous:	
System Restored By:	
Date:	Time:
System verification (such as by drain test)	

Annex C – What to do Post Loss?

Statement of issue

Knowing what to do after the fire trucks roll up their hose, or when the ambulance has left the scene, or while standing in the aftermath of a violent natural disaster requires the same meticulous planning as the preparation for these emergencies.

Each after-the-event action plan includes the directive "Establish control of the situation and demonstrate authority and organization". This is easier said than done as emergencies can cause emotional and mental trauma. This underscores the value of having an emergency action plan; there will be an answer to the most debilitating question following an emergency – "What do we do now?"

Further, demonstrating confidence and competence when responding to emergencies in itself mitigates the adverse effects of the situation. Confidence and order is contagious and restoration efforts are enhanced. (The opposite is also true; tentativeness and chaos are self-perpetuating.)

Action Plan

- After any event, any event, always account for the safety of the people. Do this first.
- Notify your insurance agent immediately. Take advantage of the assistance offered. The goal is to restore normal business operations as soon as possible.
- Assist in the preparation of the police/fire reports. Obtain copies.
- If a surveillance system is being used, notify the vendor immediately to request footage. Many surveillance cameras around the site are recording 24/7 even though the system is monitored during non-working hours.
- Engage the services of loss mitigation companies; to remove water, to provide covers that may prevent further damage, etc.
- Provide documentation of what has been damaged. Segregate salvageable goods.
- Develop a roster of who can be available to assist in restoration.
- If arson is even remotely suspected, immediately secure the fire scene so no evidence is disturbed. Notify the proper authorities.
- Provide Active Security measures if conditions are such that unauthorized entry is possible; refer to the Active Security Chapter for more information.
- Direct workers to refrain from discussing any aspect of the event with the news media or other curiosity seekers.
- Forethought must be given to who and how victims' families are notified

CONTACT INFORMATION:

When placing an emergency call, the operator will need to know: who you are, where you are and what you need. Be prepared by describing your location here:

_____

_____

_____

Police/Fire/Medical Emergencies	
Police Non-Emergency	
Fire Department Non-Emergency	

	Name	Phone
Medical/Doctor's		
Hospital		
Insurance Agent		

Field Representative Information:

US Assure E&S often utilizes third party inspection outfits to perform our site visits. Please note, third parties inspecting the project do not have the authority to make statements on our behalf regarding the adequacy of a risk adhering to the policy's requirements. If there is ever a question regarding loss control action items recommended by the field representative, please notify your assigned Loss Control engineer.

Builders Risk Insurance:

Your assigned Loss Control Engineer should have reached out prior to receiving this booklet and would be the ideal contact. For a general contact, see below.

US Assure E&S
8230 Nations Way
Jacksonville FL, 32256

usassure.com
(800) 800 - 3907
losscontrol@usassure.com

This handbook has been prepared for policyholders placed through: