Session No. 717

Protecting Your Investment to Ensure Business Continuity

Alan P. McCartney, CSP, CFPS, CHCM, EMT-P
Property Technical Director
Liberty Mutual Agency Market- Loss Prevention
Keene, New Hampshire

Much has been written over the past number of years regarding maintaining business continuum. However, many companies only pay lip service to truly investigating what can reasonably be done to address manufacturing bottlenecks, and facility preservation methods.

Since September 11, 2001, there has been an explosion in the field of business continuity and emergency management consulting. These consultants, some of which never had any prior experience in this widely varied and specialized field, are charging thousands of dollars in fees to evaluate your operations, information technology systems, and other aspects of your operations and develop reports for you.

Many of their reports end up, unread on desks, in bookcases, file cabinets or in the recycling bin because the perceived cost for implementing was deemed too expensive, or the solution considered not relevant, or management brushed the executive summary aside because “this will never happen to us”.

It all comes down to risk management. How much risk are you will to accept and how much are you willing to transfer?

Example of problems that might affect your business:

The manufacturing facility of a sole supplier of a vital component your business requires to complete a product, burns to the ground. This firm has decided not to reopen. There are not any alternative suppliers, and for you to build your own facility to duplicate what was previous manufactured for you is 18 to 24 months away. What do you do?

One of your premier products is recalled because of a defect in the metallurgy. Your company’s name is splashed across the national news. How do you respond effectively, and maintain market share?

You have multiple (redundant) production lines, however, in the production flow, there exists a bottleneck, in which every final product made must pass through. You experience a critical

failure of a component of the machinery and without a spare on-hand, you are advised that you can receive a replacement part from overseas, however shipping from overseas, and customs issues mean that you will not receive the component for 90 – 120 days. During this time, your entire production has ceased.

Your office building experience a fire, and the sprinkler system hadn't been tested and maintained in accordance with the criteria found in NFPA 25 and NFPA 72, and as result the fire pump failed to start, resulting in complete destruction of all plans and drawings related to your products You were in the midst of re-engineering your product and manufacturing line and the loss of these historical documents as well as the server in which the new work had been stored has been lost. This loss has pushed your timeline back at least 12 months, and your competition is expected to release a similar product in 3 months, and as a result, you potentially will lose substantial market share.

All of these scenarios above could realistically occur.

With regarding to property business continuity planning, there exists a number of good references that are available and when utilized can guide you in your steps to prepare your facility. There are many other methodologies and tools that exist to guide one through an evaluation. The tools that I am most familiar with are found in the National Fire Codes, specifically the first on the following list of documents:

- NFPA 1600, Standard on Disaster/Emergency Management and Business Continuity Programs (2007 edition). A free copy of NFPA 1600 is available by following this link, www.nfpa.org/assets/files/pdf/nfpa1600.pdf

- NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems (2008 edition)

- NFPA 72®, National Fire Alarm Code® (2007 Edition)

- And the testing, maintenance and inspections chapters of
  - NFPA 11, Standard for Low-, Medium-, and High-Expansion Foam
  - NFPA 12, Standard on Carbon Dioxide Extinguishing Systems
  - NFPA 12A, Standard on Halon 1301 Fire Extinguishing Systems
  - NFPA 17, Standard for Dry Chemical Extinguishing Systems
  - NFPA 17A, Standard for Wet Chemical Extinguishing Systems
  - NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems

All the current editions of the National Fire Codes are available for viewing by following this link.

http://www.nfpa.org/aboutthecodes/list_of_codes_and_standards.asp

Furthermore as found on http://www.nyu.edu/intercep/, The International Center for Enterprise Preparedness (located at New York University) is the world's first major academic center dedicated to private sector crisis management and business continuity.

Terminology

As with anything, knowledge of relevant terminology is paramount.

In the Scope in NFPA 1600 the following words are found; “a common set of criteria for disaster/emergency management and business continuity programs”, providing a defining overview for the entire document.

Additional definitions are found in NFPA 1600, although according to the NFPA technical committee, if *Merriam-Webster Collegiate Dictionary* adequately defines a word, there will not be a definition found in the NFPA standard.

Terms such as emergency management, business continuity, disaster planning, and the like are commonly used interchangeably; however, their means are slightly different. For clarity, the following definition is offered.

“Business Continuity” and “Continuity of Operations” are typically viewed as identical in intent and meaning, although the former is typically used in the private sector and the latter is the public sector. Both involved the aspect of potential losses, affective recovery solutions, and continuity of services and programs.

To gain familiarity with any terms defined in NFPA 1600, you should review Chapter 3 of this document.

The Meat and Potatoes

The bulk of NFPA 1600 is found in Chapter 4 “Program Management” and Chapter 5 “Program Elements”. Each of these two chapters are further sub-divided as follows;

<u>Chapter 4</u>

4.1 – Program Administration
4.2 – Program Coordination
4.3 – Advisory Committee
4.4 – Program Evaluation

<u>Chapter 5</u>

5.1 - General.
5.2 - Laws and Authorities.
5.3 - Risk Assessment.
5.4 - Incident Prevention.
5.5 - Mitigation.
5.6 - Resource Management and Logistics.
5.7 - Mutual Aid/Assistance.
5.8 - Planning.

5.9 - Incident Management.
5.10 - Communications and Warning.
5.11 - Operational Procedures.
5.12 - Facilities.
5.13 - Training.
5.14 - Exercises, Evaluations, and Corrective Actions.
5.15 - Crisis Communication and Public Information.
5.16 - Finance and Administration.

Details of each of these chapters and sections will not be elaborated upon in this paper.

Protecting Your Real Property and Contents

The primary emphasis of this paper is specific to protecting your property and contents from the risk of fire. There are numerous causes of loss, however, the primarily emphasis will be upon fire loss. Other property losses that need to be addressed in a property business continuity plan include; theft, natural hazards (tornados, hurricanes, ice & snow storms, earthquake and floods).

With regarding to controlling property losses, there are essentially two methodologies that exist. These are called passive fire protection, (measures do not require any external power), and active fire protection devices (requiring manual, mechanical, or electrical power for their operation).

Passive Fire Protection

According to the 20th Edition of the NFPA Handbook (FPH), they define two types of passive fire protection relative to the structure and contents (The FPH goes on to discuss a 3rd type of passive fire protection, however, since this third method is limited to life safety and egress, it has been consciously omitted form this discussion).

> "1. *Rate of fire growth.* The rate of fire growth inside or outside a building can be controlled to some extent by using interior finishes or external cladding/roofing with specific ignition, flame spread, and heat release characteristics. A slow-growing fire leaves more time for safe egress of building occupants and generally results in reduced property damage at the time of manual or automatic suppression.
>
> 2. *Containment.* Should a fire inside a building grow to full involvement of the enclosed space of origin, an important objective is to contain the fire within that enclosed space or a nearby area, at least for a certain time. Thus, fire spread to other parts of the building or adjacent buildings is delayed or prevented. This containment process for interior fires is referred to as *compartmentation.* It is accomplished by providing fire-resistive floor, wall, and ceiling assemblies and by protecting openings and penetrations through enclosure boundaries. Containment of interior fires also involves protecting structural elements and assemblies to avoid or delay partial or total collapse in the event of fire. Should a fire be initiated and grow to a hazardous scale outside of a building, an important objective is to maintain a sufficient fuel-free space or fire break around the building so that the integrity of the building envelope is preserved when exposed to the external fire hazard. This containment process for exterior fires is referred to as providing a safe separation distance. Containment of external fires also covers measures

to prevent ignition of, surface flame spread over, and penetration through exterior wall and roof surfaces should there be a nearby ignition source such as firebrands or flames ejected from windows."

Passive fire protection for (larger) properties generally result in the structure being subdivided into defined fire areas to limit the spread of fire. Horizontal fire spread is limited by space separations between buildings (or within buildings), or by 4-hour fire resistance rated fire walls. These walls go by a variety of different names, such as maximum foreseeable loss (MFL) walls, amount subject walls, maximum loss potential (MLP) walls, etc. Most are reasonable similar in construction and for the purpose of this article these terms will be interchangeably used.

In multi-story buildings, vertical spread from one story to another is limited by floor construction, exterior wall construction, and by enclosures around stairways, elevator shafts, and other openings.

The need for fire wall is usually determined by the contents and or other values exposed in a single fire. Additionally the placement of the fire walls should take into consideration property damage and loss of production. These fire walls are also used to subdivide production areas, and to separate manufacturing lines from storage.

If a fire wall is to be used, the wall must be designed for stability as well as fire resistance, and must confine an uncontrolled fire to the side of origin. Additionally, other factors must be taken in to consideration, in the construction of the wall and should consist of; protection of openings, exterior walls, parapets, penetrations, and roof construction.

Under all conditions, the design must prevent fire spread through, under, over, or around the fire wall.

One should always consider fire walls in the design of new construction. Once this occurs, consideration must also be given to providing separate electrical, mechanical, and plumbing systems on each side of the wall to help eliminate the need for penetrations through the wall, as well as dependency upon a single source for these utilities.

Consideration at the planning stage also may help in limiting the number and size of openings in the wall as well as in ensuring that loading docks, roof penetrations, and roof-mounted structures are at an adequate distance from the fire wall.

Stability is an essential property of a fire wall because it must remain standing during a fire, even if the entire building on one side of the wall collapses. Strength is necessary so the wall will be able to resist glancing blows from falling materials, force and thermal shock of fire hose streams, thermal stresses from the fire, and forces from collapsing portions of floors and/or roofs adjacent to the wall. Design considerations must be made to prevent damage as a result of these forces, which may crush the wall or deflect it laterally to the extent that its structural integrity is destroyed.

The potential for a fire during or after an earthquake increases due to the damage caused by the ground movement. The likelihood that automatic fire protection systems will be damaged or completely out of service also increases as a result of the earthquake. Therefore, passive fire

protection, such as fire-resistant construction and fire walls, becomes increasingly important in active seismic zones. Fire walls must remain stable during and after an earthquake in order to perform their purpose of subdividing properties into separate fire areas. To accomplish this, the wall must be designed for seismic loads as well as stability under fire conditions.

Meeting earthquake design requirements may eliminate one or more of the options for achieving stability that would otherwise be allowed in non-earthquake areas. For example, preventing damage to a fire wall from steel expansion during a fire by aligning the steel members on both sides of the wall and providing essentially no clearance is not an option in active seismic areas if it will allow pounding during an earthquake.

Instead of a wall, subdivision could be provided by adequate clear space between buildings (or even within a building). The area must remain clear of all combustible material.

In evaluating adequacy of clear space, consider the following items:

- building height
- slope of land between buildings
- vehicle parking between buildings
- clear space
- yard storage
- vegetation

Additionally, the construction features on each side of the separation must be considered individually because, under worst case conditions, the fire loss exposure could occur from either side.

Active Fire Protection

According to the FPH, active fire protection is defined as: **"**The operation of active fire protection devices requires manual, mechanical, or electrical power. For example, a sprinkler system requires sprinklers to open and a water supply at a sufficient flow rate and pressure after activation to be delivered through the system. A smoke control system relies on roof vents that open or a mechanical system to operate when a fire is detected. A detection and alarm system requires electric power to operate."

Fire detection systems are considered as a means to notify someone that a fire, smoke or other emergency condition exists. However, for most conditions they alone do not provide any measure of fire containment or control with regard to property loss control. Therefore, only active, automatic suppression systems are considered as adequate means to reduce the loss potential.

Proper maintenance of these systems is paramount in ensuring that they will operate properly when called to do so.

Each of the relevant NFPA codes listed at the beginning of the article provides detailed guidance, regarding methods to be followed to ensure the highest level of reliability of your fixed protection system. In too many cases, corners are cut, because of lack of knowledge by the property owner, or as a result of reduction of service due to maintenance budgets being reduced, or for any

number of other reasons heard over the years. The end result is only a portion of the tests, inspections and maintenance was conducted therefore reliability of and integrity of the system as a whole could not be substantiated.

References

Cote, Arthur E., *Fire Protection Handbook,* Quincy, Massachusetts, National Fire Protection Association, 2008

Schmidt, Donald L., *Implementing NFPA® 1600 – National Preparedness Standard,* Quincy Massachusetts, National Fire Protection Association, 2007

Maniscalco, Paul M., & Christen, Hank T., *Understanding Terrorism and Managing the Consequences,* Upper Saddle River NJ, Prentice Hall

National Fire Codes, Quincy Massachusetts, National Fire Protection Association.

Hague, David R., *Water-Based Fire Protection Systems Handbook 2nd Edition,* Quincy, Massachusetts, National Fire Protection Association, 2007