# MAXIMUM FORESEEABLE LOSS

## Table of Contents

Page



## List of Tables

## 1.0 SCOPE

This data sheet introduces the principles of maximum foreseeable loss (MFL) and highlights scenarios for specific loss events (e.g., fire in a key manufacturing plant or warehouse, equipment breakdown, runaway thermal reaction).

After a major loss event, the question "What could have been done to avoid or limit the extent of damage?" is always asked. This data sheet highlights the key items to recognize and use to develop a location-based maximum foreseeable loss scenario.

An MFL evaluation structure is provided to help evaluate the inherent, major hazards of construction, occupancy, equipment, and processes, as well as logistics and facility layout.

An MFL can be limited only by specific factors, which are covered in Data Sheet 1-42, *MFL Limiting Factors*.

### 1.1 Hazards

MFL includes nearly all perils except natural hazards.

For a description of the hazards associated with MFL, see the following FM Understanding the Hazard (UTH) publications:

- *Lack of Equipment Contingency Planning* (P0179)
- *Fire and Explosion Exposure* (P0251)

### 1.2 Changes

**October 2025.** Interim revision. Minor editorial changes were made.

## 2.0 LOSS PREVENTION RECOMMENDATIONS

### 2.1 Introduction

The maximum foreseeable loss (MFL) is the largest loss to result from an insured event, as calculated from an understanding of the overall hazard and associated business impact. This event assumes that active protection systems or safety devices are impaired, with the exception of specifically FM Approved and tested MFL fire doors. The event can be related to fire, explosion, equipment failure, or other scenarios, with the exception of natural hazards.

Organizations should have an understanding of MFL events at their key facilities in order to understand the maximum impact resulting from a rare but foreseeable event. Mitigation measures to reduce MFL exposures, whether by physical means or risk-driven solutions, can then be taken (e.g., contingency planning).

The MFL scenario is based on impaired active protection systems and/or safety devices, reliance on passive protection only, and an understanding of the overall hazard and associated business impact. Additional unfavorable conditions, such as delayed fire service response, are considered. Note that the passive protection must be a sustainable, reliable, physical limiting factor (see Data Sheet 1-42).

### 2.2 Construction

2.2.1 Use FM Approved equipment, materials, and services whenever they are applicable. For a list of products and services that are FM Approved, see the *Approval Guide* and/or Roof*Nav*, online resources of FM Approvals.

2.2.2 See Data Sheet 1-21, *Fire Resistance of Building Assemblies*, for recommendations on construction types and new construction, as well as Data Sheet 1-42, *MFL Limiting Factors*.

### 2.3 Occupancy

2.3.1 Evaluate the effect on business continuity from a maximum foreseeable event (e.g., fire, explosion, equipment breakdown) and develop strategies , including equipment contingency planning as part of a documented business continuity plan, to limit the business interruption to these events. Strategies may include, but are not limited to, the following:

A. Using fire-resistant construction

B. MFL subdivision using MFL limiting factors to passively protect high-value property or critical processes from the maximum foreseeable event.

C. Providing redundant capacity at a location not subject to the maximum foreseeable event.

### 2.4 Protection

2.4.1 The MFL event assumes that active protection systems are impaired. Therefore, protection against the MFL event is limited to passive protection that mitigates damage to property and the interruption of business resulting from the event. Refer to Data Sheet 1-42, *MFL Limiting Factors*, for more information.

### 2.5 Maintenance

2.5.1 Maintain active protection, and policies and procedures calculated to prevent the MFL event from occurring. These may include, but are not be limited to, the following:

A. Providing proper maintenance and supervision of automatic sprinkler valves and the sprinkler systems they control.

B. Maintaining fire detection and alarm systems.

C. Incorporating and enforcing policies that control or limit ignition sources, such as the following:

- Cutting and welding
- Smoking

D. Establishing a viable asset integrity program for the inspection, testing and maintenance of equipment.

2.5.2 Maintain MFL limiting factors (see DS 1-42) for effectiveness and reliability.

### 2.6 Contingency Planning

2.6.1 Review, test and validate the strategies, business continuity plans and equipment contingency plans in place to maintain viability and confirm efficacy (see Section 2.3.1 and Loss Prevention Data Sheet 9-0, *Asset Integrity*).

## 3.0 SUPPORT FOR RECOMMENDATIONS

### 3.1 MFL Evaluation

An MFL scenario, regardless of the type of event, consists of four major components:

1. The peril (e.g., fire, explosion)
2. The scenario timeline (e.g., fire development, spread. and control)
3. Damage to property
4. Business interruption

Whilst the peril associated with the MFL event is usually easy to determine, the remaining three components can be highly variable and complex.

The scenario progression is highly dependent on the peril, construction, and occupancy.

The estimate of property damage is also dependent on these same three components and an in-depth understanding of the products, systems or processes and their susceptibility to the peril.

The quantification of the business interruption impact can be highly complex. The impact to the income stream of the business must consider upstream and downstream impacts not only at the location under consideration, but across all locations of the business.

#### 3.1.1 Peril

The event can be related to fire, explosion, equipment breakdown with ensuing damage or other scenario, with the exception of natural hazards.

#### 3.1.2 Scenario

The scenario assumes active protection systems or safety devices are impaired, with the exception of specifically FM Approved and tested MFL fire doors.

#### 3.1.3 Property Damage

Property damage should consider the total cost of repairing/replacing damaged property, including cleanup; planning; hiring consultants, architects, engineers, etc.; reconstruction; and installation and commissioning of equipment. The amount of damage to involved property should consider the type of event, as well as the given physical circumstances.

For example, for a single warehouse building storing plastic components in a structure that uses combustible plastic insulation on a steel frame, the MFL event is an uncontrolled fire. In this scenario, 100% loss of building, contents, and stock would be assumed.

Conversely, for a fire in a dry machine shop housed in a reinforced concrete building, even in an MFL event only limited damage to machinery and building is considered.

#### 3.1.4 Business Interruption

##### 3.1.4.1 Restoration Time

Time required to fully restore operations on site is divided into three main phases:

**Phase 1:**

- Any authority investigations
- Cleanup of contamination and environmental impacts
- Discussions regarding permits, etc.
- Removal of debris

**Phase 2:**

- Construction, including design and permits, changes in legislation from original buildings, etc.

**Phase 3:**

- Fit-out, considering lead time of equipment, setup, startup, and quality assurance of process or products, and approval from authorities if needed

##### 3.1.4.2 Interdependencies

Any impact on company production (upstream and downstream of site) until operations are fully restored, and the associated impact thereof.

##### 3.1.4.3 Mitigation

Consider viable equipment contingency planning, equipment breakdown sparing (including N+1 online sparing) and business continuity planning that can minimize the business interruption impact during the MFL restoration time.

Make-up capacity could be present at other locations within the company, or any third-party contracts that are in place. Generally, only make-up capacities that are verified by a business continuity plan (that is regularly updated with internal and external partners) should be considered.

##### 3.1.4.4 Additional Loss of Revenue

In many cases, the loss event will not end with full resumption of production operations. Any impact on revenue or sales following the restoration time should be considered in the MFL scenario. Factors to consider include the likelihood of loss of market share following full restoration of the physical damage. Business interruption can allow competition to increase their market share. Getting back lost customers is often more difficult and costly than acquiring new ones.

#### 3.1.4.5 Extra Expenses

Consider any additional costs that can be expected from an MFL loss event, such as the following:

- Contractual penalties
- Decontamination costs
- Regulatory fines

## 3.2 MFL Perils

In general, there are three main types of MFL events: fire, explosion, and equipment break down. The following sections describe key items to consider.

### 3.2.1 Fire

For most facilities, the maximum foreseeable loss scenario results from a fire. A starting fire is expected to grow and spread via all available combustibles. For example: combustible materials in construction or installations, raw materials, products, packaging materials, etc. Within a building (or complex of building sections) such combustibles are often available. In this case, a fire will involve the entire building or all building sections and, if large enough, will jump spaces between buildings.

### 3.2.2 Explosion

Some facilities have an inherent explosion risk associated with their operations that can cause the maximum foreseeable loss event. An explosion can result from combustible dust, flammable gas, or ignitable liquid.

If the initial explosion event can result in fire spreading via additional combustibles, the total event can be analyzed as a fire event. This applies to many operations involving ignitable liquids.

Facilities handling large quantities of flammable gas or ignitable liquid held above their atmospheric boiling point may have the potential for an explosion. Special conditions are needed for this to occur. This typically only applies at large chemical and oil/gas types of operations and is often the MFL scenario when the potential exists. See FM Data Sheet 7-42, *Evaluating Vapor Cloud Explosions Using a Flame Acceleration Method*, for more details.

Gas explosions can cause the maximum foreseeable loss event, especially if related to critical pieces of equipment such as gas-fired boilers or turbines.

Dust explosions can result in the maximum foreseeable loss scenario if an initial event propagates between pieces of equipment and/or causes a secondary explosion that cascades through the facility.

Certain materials are highly energetic and have a severe inherent explosion potential (see Data Sheet 7-28). Their storage, handling, and use is typically heavily regulated. For example, by AASTP-1, *Manual of NATO Safety Principles for the Storage of Military Ammunition and Explosives*. Analysis of the maximum foreseeable loss event is part of the hazard assessment of the operations.

### 3.2.3 Equipment Breakdown

A maximum foreseeable event can result from an equipment breakdown scenario that results in ensuing damage to surrounding/connected equipment, systems and buildings. Equipment breakdown is a prominent cause of loss of containment leading to a fire and/or explosion. Preventing equipment breakdown and keeping energy sources contained is contingent on how the equipment is designed, installed, operated, maintained and protected. Contributing factors impacting the exposure from an equipment breakdown scenario can include location/process and equipment specific conditions, unique design/purpose-built equipment for the process, materials of construction, obsolete equipment and long lead times for replacement equipment.

### 3.2.4 Contamination

Two events in which contamination was a leading factor were the Bhopal incident at a Union Carbide pesticide plant on 2 December 1984, and the Seveso incident at the ICMESA plant on 10 July 1976. In both cases a runaway reaction caused toxic gas to be released to the atmosphere once containment was lost. Other contaminations may include PCBs, asbestos, or biohazards.

### 3.3 MFL Limitation

An MFL event means that active protection systems and/or safety devices are not operating, plus additional, foreseeable unfavorable conditions, such as human error or delayed/ineffective fire service response are considered.

#### 3.3.1 Fire

Fire spread in a maximum foreseeable fire scenario can be stopped by constructing an MFL fire wall in a building or complex of attached buildings (see Data Sheet 1-42).

A maximum foreseeable fire scenario involving an entire building or attached building sections can be prevented from involving any other detached buildings by adequate space separation (see Data Sheet 1-42).

#### 3.3.2 Explosion

Explosion hazards are typically inherent to materials and processes. Inherently safer processes can eliminate hazards (such as a vapor cloud explosion potential) or reduce them (for example, by reducing the batch size of reactions or storing smaller amounts of energetic materials in one place).

Limiting the MFL event for dust explosions is possible by:

- separation of process lines so equipment is interconnected to a limited extent.
- ensuring no secondary explosion potential exists.

The energy released in vapor cloud explosions or energetic material explosions cannot be limited. Their impact can only be reduced by specific facility lay-out design and (pressure-resistant) building construction.

#### 3.3.3 Contamination

If contamination is a significant factor in the maximum foreseeable loss scenario, the hazard is inherent to the chemicals that are produced, or used in the process or support systems. Inherently safer processes can eliminate hazards or reduce them.

#### 3.3.4 MFL and Facility Layout

History is full of MFL events, the lessons of which are still relevant today. One of the most severe happened in England in 1666, when a fire originating in a bakery nearly burned down the entire city of London. Houses were built extremely close together (i.e., lack of space separation), which enabled the fire to spread. Soon after this event, fire walls were invented.

The layout of harbors for sailing ships evolved so the “tar cookers” needed to seal the bodies of the ships were no longer placed next to the warehouse in which the trade goods were stored, due to the tendency of the tar cookers to ignite the buildings around them.

Boiler houses were built with wooden roofs to save the building should a steam explosion occur (and yet boiler houses are still built with vessels pointing toward each other, meaning that if one explodes the others are taken with it).

The production world is constantly changing, and with those changes industry is experiencing an increased use of combustible materials within production and products. An example of this is in the automotive industry. More and more plastic boxes are being used for internal factory logistics, and typical cars are now about 50% plastic or composite materials by volume.

Maximum foreseeable loss scenarios change over time, too, as production methods and logistics change. The layout of a facility should be influenced by the answers to the following questions:

- What are we willing to lose under worst-case condition?
- What are the inherent hazards of our operations?
- What is the difference between the expected impact of a “normal” and a maximum foreseeable loss?
- Should only noncombustible construction materials be used?
- Can similar production lines be set up in separate buildings to avoid putting “all our eggs in one basket?”

Can we set a standard for protection against typical loss scenarios to reduce the likelihood of an MFL event (e.g., fire walls, sprinklers, explosion venting, interlocks for ignitable liquids, n+1 support systems, redundant equipment)?
And, once the layout is established, will new buildings be placed in spaces that have in the past been reserved to ensure fire will not spread to the next building?

A facility layout starts with a conscious decision to limit and protect against the MFL event. The following points can be used as a guide:

A. Where possible, separate production, storage, and support areas. Use noncombustible construction for walls and roofs, and create a space between buildings that is in accordance with Data Sheet 1-42.

B. As an alternative to space separation, consider removing combustibles from a dedicated areas to prevent a fire from spreading. This applies only to non-combustible buildings of substantial area (see space separation guidance in Data Sheet 1-42). The amount of combustibles should be so low that no automatic fire protection would be needed in case of an ignition source being present in the building.

C. As an alternative to space separation, consider constructing a MFL wall between critical buildings.

D. Consider DLC - Damage Limiting Construction for explosion hazards.

E. Consider Redundancy of key processes.

F. Consider impact on revenue following restoration time of operations after an MFL event (i.e., contingency planning).

The awareness that MFL events can happen is the start of successful management of those events. A commitment to managing change is also required to prevent mitigation strategies from becoming neglected or eroded by outside forces optimizing space, processes, or construction.

### 3.4 Loss History

#### *3.4.1 Illustrative Losses*

Table 1 contains losses that are considered major events.

*Table 1. Selected Major Loss Events*

| *No.* | *Name of Loss* | *Brief Abstract* |
|---|---|---|
| 1 | General Motors<br>Livonia, MI | Sparks from a torch contacted ignitable liquid, uncontrolled fire ensued. |
| 2 | K-Mart Corp.Falls Township, PA | Ignition of a ruptured aerosol can led to uncontrolled fire and near total constructive loss. |
| 3 | TRW Inc<br>Harrisburg, PA | Electrical ignition of ignitable liquid due to low oil level led to large-scale fire. |
| 4 | Universal Studios<br>Universal City, CA | Hot work or electrical fault led to a large-scale fire. |
| 5 | Ford Werke, A.G.Nordrhein Westfalen, Germany | Discarded cigarette or match ignited plastic inventory that led to near total constructive loss. |
| 6 | McCormick Place<br>Chicago, IL | Combustible contents led to total constructive loss. |

## 4.0 REFERENCES

### 4.1 FM

Data Sheet 1-2, *Earthquakes*
Data Sheet 1-3, *High-Rise Buildings*
Data Sheet 1-20, *Protection Against Exterior Fire Exposure*
Data Sheet 1-21, *Fire Resistance of Building Assemblies*
Data Sheet 1-28, *Wind Design*
Data Sheet 1-28R/1-29R, *Roof Systems*
Data Sheet 1-44, *Damage-Limiting Construction*

Data Sheet 1-54, *Roof Loads for New Construction*
Data Sheet 3-26, *Fire Protection Water Demand for Non-Storage Sprinklered Properties*
Data Sheet 7-4, *Paper Machines and Pulp Dryers*
Data Sheet 7-32, *Ignitable Liquid Operations*
Data Sheet 7-42, *Evaluating Vapor Cloud Explosions Using a Flame Acceleration Method*
Data Sheet 7-43, *Loss Prevention in Chemical Plants*
Data Sheet 7-54, *Natural Gas and Gas Piping*
Data Sheet 7-88, *Outdoor Ignitable Liquid Storage Tanks*

## APPENDIX A GLOSSARY OF TERMS

**Approval Guide:** An online resource of FM Approvals listing FM Approved products and services.

**Class 1:** Class 1 includes FM Approved plastic panels and plastic building panels. FM Approved foam insulated wall/ceiling constructions that use a polyurethane or polyisocyanurate foam core and steel or aluminum-faced panels are considered Class 1. FM Approved insulated steel deck roof assemblies are also considered Class 1.

**Combustible (C):** Includes painted or unpainted wood, rigid plastic building materials that are not FM Approved, and Class 2 insulated steel decks.

**Fire resistive:** For more information, including specific hourly fire ratings, refer to Data Sheet 1-21. This category includes concrete (tilt-up, precast, poured-in-place), concrete block, brick (but not quarter brick which is only about 1/2 in. [13 mm] thick when used as a veneer in EIFS systems), metal sandwich panels with a gypsum board core, and plaster/stucco (not EIFS). Well-maintained concrete or masonry walls without openings usually need little or no separation or protection against fire exposure.

**FM Approved:** Products and services that have satisfied the criteria for Approval by FM Approvals. Refer to the *Approval Guide* and Roof*Nav* for a complete listing of products and services that are FM Approved.

**High-rise building:** Any building with an occupied floor located more than 75 ft (23 m) above the lowest level of fire service vehicle access with the exception of:

- Airport traffic control towers
- Open parking garages
- Amusement park structures
- Bleachers
- Grandstands
- Stadiums
- Special industrial buildings (ex. BLRB)
- Buildings with high hazard occupancies

**Limiting factor:** A physical barrier that stops the spread of fire or provides containment of explosive force. The control of damage from these or other events is entirely dependent on structural integrity, susceptibility of contents, fire-resistant and damage-limiting construction or adequate space separation. Limiting factors can change over time and result in significantly larger losses than anticipated if improperly managed. These factors, therefore, warrant a high level of validation, documentation, and oversight.

**Make-up:** The action of a client that is beyond their normal operating procedures and is intended to mitigate lost production, services or revenue.

**Maximum foreseeable loss (MFL):** The largest loss to result from an event, as calculated from an understanding of the overall hazard and associated business impact. This event assumes active protection systems or safety devices are impaired, with the exception of specifically FM Approved and tested MFL fire doors. The event can be related to fire, explosion, equipment failure, or other scenario, with the exception of natural hazards.

**MFL limiting Factor:** See “Limiting factor.”

**Noncombustible (NC):** Noncombustible walls are walls that will resist 27 kW/m$^2$ of radiant heat exposure indefinitely without ignition, penetration, the opening of joints, or failure. NC walls usually consist of panels over steel framing. Panels may be painted or galvanized steel, corrugated iron, or corrugated cementitious panels supported on a steel frame. The panels are light in weight, and unless protected or adequately separated, they may buckle and open at their joints, or crack under severe radiation or fire exposure. Since heat will easily conduct through thin steel and ignite combustible insulation, insulations acceptable for use in this category include glass fiber, mineral wool, and expanded glass. For other types of insulation, see Class 1 or combustible categories.

Noncombustible panels also include protected metal panels and fiber-reinforced cement panels FM Approved and listed in the Approval Guide under Exterior Roofing and Siding.

**Reinforced concrete:** Construction using a composite material made from concrete and steel (or another material, such as glass fiber-reinforced plastic) where the concrete and reinforcement work compositely. Examples of reinforced concrete walls are tilt-up construction and precast concrete construction.

**Reinforced masonry:** Masonry units, reinforcing steel, grout, and/ or mortar combined to act together to resist design loads. Reinforced masonry generally has both vertical and horizontal steel reinforcement.

**RoofNav:** An online resource of FM Approvals listing FM Approved roofing products and assemblies.

## APPENDIX B DOCUMENT REVISION HISTORY

The purpose of this appendix is to capture the changes that were made to this document each time it was published. Please note that section numbers refer specifically to those in the version published on the date shown (i.e., the section numbers are not always the same from version to version).

**October 2025.** Interim revision. Minor editorial changes were made.

**April 2025.** Interim revision. Minor editorial changes were made.

**October 2024.** Interim revision. Minor editorial changes were made.

**July 2023.** Interim revision. Minor editorial changes were made.

**January 2023.** Interim revision. Minor editorial changes were made.

**July 2022.** Interim revision. Minor editorial changes were made.

**January 2022.** Interim revision. Minor editorial changes were made.

**July 2021.** Interim revision. Minor editorial changes were made.

**April 2020.** Interim revision. Minor editorial changes were made.

January 2020. Interim revision. Minor editorial changes were made.

**April 2019.** This document has been completely revised. Major changes include the following:

A. Data Sheet 1-22 has been split into two documents: Data Sheet 1-22, *Maximum Foreseeable Loss*, and new Data Sheet 1-42, *MFL Limiting Factors*.

B. Moved all material on the protection of openings (fire doors) to new Data Sheet 1-42.

**July 2015.** Interim revision. Minor editorial changes were made.

**February 2014.** Interim revision. Minor editorial changes were made.

**October 2013.** The following changes were made:

- Revised Section 2.2.2.2.10 on explosion hazard distances.
- Revised penetration and fire stop recommendations based on comments from the Firestop Contractors International Association.
- Changed Light/Ordinary occupancy hazard classification to HC-1/HC-2 to be in agreement with Data Sheet 3-36, *Fire Protection Water Demand for Non-Storage Sprinklered Properties.*
- Revised recommendations on roof drains and scuppers near MFL walls.
- Corrected the analysis of the exposure length (L) to make it consistent with Data Sheet 1-20, *Protection Against Exterior Fire Exposure.*
- Corrected the numbering as there were two sections numbered 2.5.2.1.23.
- Relocated the text of Figures 8 and 16 into the recommendations.

- Revised figures for clarity.
- Made minor editorial changes.

**April 2011.** This document now contains all data sheet material on MFL limiting factors and the protection of openings in MFL limiting factors.

- Data Sheet 1-23, *Protection of Openings in Fire Subdivisions,* former Section 2.1, Openings in MFL Fire Walls, has been relocated to this document.

**June 2009.** Minor editorial changes were made for this revision.

**January 2009.** The following changes were made:

- The space separation section was revised.

**August 2007.** Corrected references in section 2.1.1. Added information to recommendation 2.2.2 on how to treat multi-pane (2 or more) window systems with respect to fire exposure for space separation.

**May 2007.** Minor editorial changes were made for this revision.

**August 2006.** The main change to this data sheet is the addition of specific guidance for building MFL walls in FM earthquake zones 500-year or less.

Some other additions were made to the MFL wall recommendations to provide better guidance on building MFL walls.

**May 2005.** Recommendation 2.1.1.11.4 was revised to be consistent with recommendation 2.1.1.3.2 in the Data Sheet 1-23, *Protection of Openings in Fire Subdivisions*.

**September 2004.** References to FM earthquake zones have been modified for consistency with Data Sheet 1-2, *Earthquakes*.

**May 2000.** This revision of the document has been reorganized to provide a consistent format. Added alternative method for evaluating space separation. A multi-phase approach is now possible. For a conservative estimate, evaluate space first using the traditional simpler guidelines contained in Table 3. For situations where a more precise evaluation is required, apply the more complex methodology contained in Data Sheet 1-20, *Protection Against Exterior Fire Exposure*, without crediting sprinkler protection on either side. Monitors, penthouses, cooling towers or other roof mounted structures should also be evaluated using the Data Sheet 1-20 methodology.

**February 1993.**

- Additional information has been added for evaluation of space separation between buildings to further clarify acceptable conditions. It is important to remember that construction features on both sides of the separation must be considered individually since the MFL exposure could occur from either direction.
- The alternative for use of a fire retardant coating, such as an intumescent mastic, to protect the top surface of a roof cover next to an MFL wall has been deleted. This is due to adverse experience in at least one application where the material tended to break up due to flexing of the roof deck from foot traffic.
- It is recommended that a portion of the live load, as well as the entire dead load, be considered when using the catenary cable formula for tied walls. The portion of the live load being considered has been reduced from 75% to 25% to be consistent with the logic behind building codes and to reflect the unlikelihood of the two extreme events occurring simultaneously.
- An advisory comment has been added regarding the arrangement of racks adjacent to MFL fire walls to prevent possible damage to the wall from collapsing racks during an uncontrolled fire.

**September 1985.**

- Table 1 was added to give recommended spacing between the wall and steel framing or between a double wall based on the span of the framing perpendicular to the wall.
- Some changes were made regarding the distance between structural steel and MFL fire walls.
- Recommendations for bond beams and grouted cores of concrete block at the top of MFL fire walls have been made.
- Additional design information was given for tied MFL fire walls.

- End wall exposure protection was added for buildings over 40 ft (12.2 m) in height.
- Angle exposure protection was increased slightly based on theoretical calculations made in conjunction with the Basic Research Department.
- Intumescent dampers are not recommended as they may be damaged by hose streams.
- It is now recommended that cables penetrate walls near floor level to further decrease the probability of cables damaging the fire wall. The alternative of looping cable that penetrated an MFL fire wall at roof level was deleted.
- Alternative protection for roofs, other than built-up roofing, was added.
- Some minor changes were made regarding space separation.
- A loss experience section was added.
- The recommended minimum spacing between the openings in MFL fire walls and combustible storage in the direction parallel to the wall was increased from 1 ft (0.3 m) to 2 ft (0.6 m) due to the low probability of achieving a tight fit between the wall opening and the door or its guide rail.
- It is now recommended that a portion of the live load, as well as the dead load, be considered when using the catenary cable formula for tied walls.
- When roof mounted structures are within 50 ft (15.2 m) of MFL fire walls, fire-rated construction should be provided on the exposed side of the roof projection. The amount of fire resistance the partition should have is dependent upon the severity of the exposure and the distance between the exposure and the roof projection.
- Special protection is needed when heat and smoke vents, skylights and roof penetrations are within 25 ft (1.8 m) of an MFL fire wall. Heat and smoke vents should be of metal construction and skylights should be constructed of wired glass or tempered glass. Intake and exhaust ducts should be equipped with automatic closing fire dampers flush with the roof deck and care should be taken to prevent the closing mechanism from rusting. In each case, combustibles should not be stored within 8 ft (1.8 m) of roof penetrations.

**August 1976.**

- Loss Prevention Data Sheet 1-22, *Criteria for Maximum Foreseeable Loss Subdivision.*
- Superseded Handbook Chapter 7.
- Provided the definition of Maximum Foreseeable Loss.
- Provided general design criteria for MFL fire walls and MFL space separation.

**April 1952.**

- First printing of Loss Prevention Data Sheet 1-22, *Fire Walls and Fire Partitions.*