



Fire Underwriters Survey of Canada

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Who do we represent?

- Fire Underwriters Survey represent the Insurance Bureau of Canada, commonly known as I.B.C.
- Dating back to the turn of the century when major fires involving entire city blocks were occurring in Canada and the U.S., the National Board of Fire Underwriters in the United States assembled an engineering team to carry out a detailed study of the fire conditions in major cities.



History – Conflagration Fires

- The Great Portland Fire
- The 1866 fire left 10,000 of Portland's 13,000 residents homeless.
- 2,000 buildings were destroyed.
- Insurance companies could not meet their financial obligations to their clients.
- Major insurance companies came together and passed a resolution founding the:

NATIONAL BOARD OF FIRE UNDERWITERS



History – Conflagration Fires

(cont'd)

The devastating effects of conflagrations illustrated that communities were not always able to provide a level of fire protection that was appropriate for the level of fire risk in the community



The Great Toronto Fire 1904



History – Conflagration Fires

(cont'd)

- Many other examples of enormous conflagrations in cities exist, too many to list
- These conflagrations have a long lasting and terrible impact on the communities they affect

- 1812 - Buffalo, New York burned during the War of 1812
- 1813 - Portsmouth, New Hampshire
- 1813 - York, Upper Canada burned during the War of 1812
- 1817 - St. John's, Newfoundland
- 1821 - Paramaribo, Suriname, over 400 houses destroyed
- 1827 - Great fire of Turku
- 1835 - Great Fire of New York
- 1845 - Great Fire of Pittsburgh destroyed over 1000 buildings
- 1846 - St. John's, Newfoundland
- 1849 - St. Louis Fire
- 1862 - Troy, New York, over 500 buildings destroyed
- 1871 - Great Chicago Fire - destroyed the downtown
- 1871 - Peshtigo, Wisconsin Fire of 1871 destroyed in a firestorm
- 1872 - The Great Fire of Boston, Massachusetts, destroyed 776 buildings
- 1877 - Saint John, New Brunswick Fire destroyed 1600 buildings
- 1889 - Great Seattle Fire
- 1892 - St. John's, Newfoundland
- 1894 - Great Fire in Shanghai; over 1,000 buildings are destroyed
- 1901 - Great Fire of 1901, Jacksonville, Florida
- 1904 - Great Baltimore Fire
- 1904 - Great Toronto Fire
- 1906 - San Francisco earthquake and fire
- 1914 - Great Salem Fire of 1914
- 1917 - The Halifax Explosion, largest man-made explosion before the atomic bomb
- 1917 - Over 300 acres (73 blocks) destroyed in Great Atlanta fire of 1917
- 1917 - Great Fire of 1917, Thessaloniki, Greece
- 1921 - Tulsa Race Riot, 35 city blocks; 1,256 residences were destroyed by arson
- 1923 - Tokyo, Japan following the Great Kantō earthquake
- 1991 - Oakland Hills firestorm kills 25 and destroys 3469 homes and apartments
- 2002 - Lagos armoury explosion causes fire which destroys half of Lagos and killed 1,100 people
- 2002 - Edinburgh Cowgate fire
- 2002 - Rodeo-Chediski fire



History

- Without some form of direct *Cost-Benefit* many communities find it difficult to convince local property owners of the importance and value of spending tax dollars on fire protection and fire prevention
- *What is the result of this trend?*



History

- The American Insurance Association and The National Board of Fire Underwriters established a municipal inspection and grading system
- They hired a team of engineers who surveyed congested centers within communities.
- The grading system that was developed and implemented was utilized to set the insurance rates for property owners throughout communities



History

The results of this study were:

- A standardized schedule was developed for grading communities Fire Defenses and Fire Risks
- Today this schedule has been modified to reflect the changing character of communities and the advances made in public fire protection and technology



History

- Communities realized that by developing *effective and recognized* forms of fire protection and fire prevention, they could dramatically reduce the cost of insurance premiums for the constituents and property owners
- Insurers were able to influence local governments to reduce fire loss risk by providing a cost benefit incentive



History

- Many communities continue to make significant improvements and the Cost-Benefit of reduced insurance premiums provides a large measure of the needed motivation.
- The Cost-Benefit is often a critical component for communities that need to find a way to offset increased property taxes to provide fire protection



Is the grading schedule made up strictly from an insurers perspective?

- No, the grading schedule has adopted and makes reference to numerous other accepted national and international standards including but not limited to:
- National Fire Protection Association (NFPA),
- Underwriters Laboratories of Canada (ULC)
- International Fire Service Training Association (IFSTA)
- The various Provincial and National Building and Fire Codes.



Two Grades

As part of the grading system we assign two grades to each Canadian community with organized public fire protection.

- **Public Fire Protection Classification (PFPC)**
 - *the ability to combat a major fire in the community*
- **Dwelling Protection Grade (DPG)**
 - *the ability to combat a Single Family Residential fire*



Differences PFPC & DPG

Public Fire Protection Classification

- Complex and detailed analysis
- Grades between 1-10
- 1 being the best and 10 meaning no organized fire protection

Dwelling Protection Grade

- Simple system of analysis
- Grades between 1-5
- 1 being the best and 5 meaning no organized fire protection



Overview of FUS Rating Criteria

FEATURE	WEIGHT
Fire Department	40%
Water Supplies for Fire Fighting	30%
Fire Safety Control - Prevention	20%
Fire Service Communications	10%



Fire Department – 40%

Fire Department Operations

- Number of pumper and ladder companies
- Distribution of apparatus
- Apparatus design and conditions
- Personnel training
- Training programs
- Response Coverage
- Equipment quality
- Pre-fire planning
- Record keeping

NFPA 1201

Standard on Developing Fire Protection Services for
the Public, 2000 Edition

- General
- Purpose of a Fire Department
- Governmental Responsibility
- Strategic Planning
- Organizational Structure
- Financial Management
- HR Management
- Training
- Org for Fire Suppression
- Emergency Scene Management
- EMS
- Community Relations
- Public Fire Safety Ed
- Code Enforcement
- Fire Investigation
- Comms
- Equipment & Buildings
- Mgmt of Water
- HazMat
- Major Emergency Mgmt
- Mgmt Reports





NFPA Standards

- NFPA has numerous standards for the delivery of Fire Protective Services
- Many of these are used by the Fire Underwriters Survey in assessing Fire Department Equipment and Operations
- NFPA 1710 and NFPA 1720 are used extensively



NFPA and FUS

- NFPA 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments
- NFPA 1720 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments



ULC S515-04

- All Fire Fighting apparatus must meet the ULC S515-04 for Firefighting Apparatus
- The Standard defines the minimum performance requirements for new automobile fire fighting apparatus such as
 - pumpers,
 - water tank trucks,
 - ladder trucks,
 - aerial devices and
 - combinations of these, used for structural fire fighting in municipal fire service.



Apparatus Maintenance Program



- ULC listed
- Age – older equipment is less reliable
- Maintenance personnel
 - NFPA certification
 - FD vs. municipal garage
 - Annual service testing of pumpers (FUS witness)
 - Aerial ladder and elevating platform (non-destructive)
 - Records of testing



Working together with surrounding communities

- Mutual Aid agreements
- Automatic Aid agreements
- Contract for suppression service agreements, to a Municipality and from a Municipality (Borrowed protection)
- Joint Agreements



Water Supply 30%

- An analysis of the water supply system begins at the source and follows it through the supply and distribution system to the hydrant.

Some of the factors considered under the water supply include:

- Capacity to provide *Required Fire Flows*
- Adequacy and reliability
- Redundancy and looping
- Hydrant distributions, spacing and maintenance



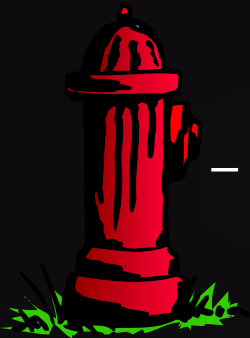
FUS Grading



– Cornerstone of Grading: *Required Fire Flows*

- Amount and rate of water needed to confine & control
- Based on structural conditions
 - Construction
 - Area of building and number of storeys
 - Occupancy
 - Hazards within occupancy
 - Provision of private protection such as sprinklers

- Extensive hydrant fire flow testing carried out to verify available fire flows





FUS Grading



Water Supply – Distribution System

- Hydrants
 - Installation and Maintenance
 - Spacing & Distribution Benchmark: 500' in residential, & 300' in commercial
- Sizing and installation of water mains
 - Layout
 - Looping
 - Redundancy
- Valve maintenance programs
- Records – 5 years
- Recent Engineering studies



FUS Grading

Water Supply – Source to Distribution

- Supply System - from source to delivery
 - Focus on adequacy and reliability of supply
 - Redundancy of key components including sources, primary mains, pumps and reservoirs
 - Back-up Power Supply
- Conditions that can impede supply are considered
 - Natural Disasters: Earthquake, Drought, Forest fires, Avalanches
 - System design without redundancy
 - Under-design
- Assess impact of main breaks, pump outages, power outages
 - Back-up storage, emergency power supplies





Water Supply Standards

Fire Underwriters Survey:

Water Supply for Public Fire Protection

- The accepted Canadian standard for requirements for water supplies for fire fighting
- Includes details for calculating Required Fire Flows for individual buildings or zones
- Includes details for calculating required water volume storage for reservoir sizing
- Design to this standard ensures that water supplies will be adequate for fire insurance grading



NFPA 1142 Standard on Water Supplies for Suburban and Rural Fire Fighting



- Establishes the minimum requirements for water supplies for structural fire-fighting purposes in rural and suburban areas not on municipal water supplies
- Includes cistern design, water hauling operations, and how to calculate water supply needs



Fire Safety Control – 20%

- Elevated to 20% to reflect the need to shift from fire fighting to fire prevention
- Permanent or part-time staff assigned to fire prevention department
 - Fire Prevention Program and Code Enforcement
 - Building Inspections
 - Plan Check Program
 - Public Education Program
 - Pre-Plan Program



Fire Service Communications 10%

Factors considered include:

- The communications centre
- Means of transmitting alarms by public
- Means of alarm dispatch and dispatching services
- Radio communications



Fire Grades Defined

- Protected – Category 1
 - Best Grade resulting in lowest insurance premium
 - building is located within 1,000 feet of a working fire hydrant and 8 kms of a fulltime responding fire hall
- Semi Protected – Category 2
 - Resulting in average insurance premium
 - building is located within 8 kms of a fulltime responding fire hall
- Unprotected – Category 3
 - Resulting in highest insurance premium, highest deductibles
 - building has no fire protection

Public Fire Protection Classification

10-class system

simplified to 3-tier System used by Insurers



PFPC Class	Versus	3-Tier System (Industry)
1 2 3 4		1 or "Protected"
5 6 7		2 or "Semi-Protected"
8 9 10		3 or "Unprotected"



How do Fire Grades affect Small Commercial Business Premiums?

The following illustrates premium rating on a masonry retail building:

- Built 1990,
- 2,000 square foot ,
- Alarms and fire extinguishers,
- Small light commercial – retail store, office,
- Replacement cost of \$300,000



How do Fire Grades affect Small Commercial Business Premiums?

Scenario 1

Business is located in a Protected Area

– Category 1

Average Premiums quoted effective September 15, 2006

- Company A: \$700
- Company B: \$790
- Company C: \$650
- Company D: \$850
- Average of 4 Companies: \$748



How do Fire Grades affect Small Commercial Business Premiums?

Scenario 2

Business is located in a Semi- Protected Area – Category 2

Average Premiums quoted effective September 15, 2006

- Company A: \$1,140
- Company B: \$1,190
- Company C: \$1,260
- Company D: \$1,350
- Average of 4 Companies: \$1,235



How do Fire Grades affect Small Commercial Business Premiums?

Scenario 3

Business is located in a Unprotected Area – Category 3

Average Premiums quoted effective September 15, 2006

- Company A: \$2,250
- Company B: \$3,000
- Company C: \$2,700
- Company D: \$3,200
- Average of 4 Companies: \$2,788



How do Fire Grades affect Small Commercial Business Premiums?

Summary

- Built 1990,
- 2,000 square foot ,
- Alarms and fire extinguishers,
- Small light commercial – retail store, office,
- Replacement cost of \$300,000

Average premium over 4 major insurers

Protected Area (1): \$748

Semi-Protected Area (2): \$1,235 (65% more than 1)

Unprotected Area (3): \$2,788 (272% more than 1)



Homeowners and Renters Fire Rating Classifications

- Fire Rating Classification is the main premium rating component used by Insurance companies to determine premiums or if a property is insurable
- Homes that do not have access to adequate Fire Department protection (“Unprotected”) will almost always sustain more damage than homes that have access to quality fire response (“Protected”)
- Homeowners and Renters insurance premiums are classified into three categories or fire grades
 - Home is located in an Unprotected Area – Category 3
 - Home is located in a Semi Protected Area – Category 2
 - Home is located in a Protected Area – Category 1



2. Dwelling Protection Grades (DPG) - Residential



Section 95 Housing - Single-family Rental


- Grading reflects the ability of a community to handle fires in residential buildings
- Scale of 1-5, & DPG 1 is the best

Dwelling Protection Grades

5-grade system

simplified to 3-tier System used by Insurers



DPG Grade	Versus	3-Tier System (Industry)
1 2 3A		1 or "Protected"
3B 4		2 or "Semi-Protected"
5		3 or "Unprotected"



How do Fire Grades affect Homeowners Insurance Premiums?

The following illustrates premium rating on a standard construction home:

- Built 1980,
- 1,000 square foot ,
- Three bedroom,
- 2 baths,
- Partially finished basement,
- Replacement cost of \$125,000



How do Fire Grades affect Homeowners Insurance Premiums?

Scenario 1

Home is located in a Protected Area

– DPG 1

Average Premiums quoted effective September 15, 2006

- Company A: \$407
- Company B: \$396
- Company C: \$480
- Company D: \$518
- Average of 4 Companies: \$450



How do Fire Grades affect Homeowners Insurance Premiums?

Scenario 2

Home is located in a Semi-Protected Area – DPG 2

Average Premiums quoted effective September 15,
2006

- Company A: \$508
- Company B: \$588
- Company C: \$711
- Company D: \$1,138
- Average of 4 Companies: \$736



How do Fire Grades affect Homeowners Insurance Premiums?

Scenario 3

Home is located in an Unprotected Area – DPG 3

Average Premiums quoted effective September 15,
2006

- Company A: \$1,216
- Company B: \$1,102
- Company C: \$1,384
- Company D: \$1,882
- Average of 4 Companies: \$1,396



How do Fire Grades affect Homeowners Insurance Premiums?

Summary

- Built 1980,
- 1,000 square foot ,
- Three bedroom,
- 2 baths,
- Partially finished basement,
- Replacement cost of \$125,000

Average premium over 4 major insurers

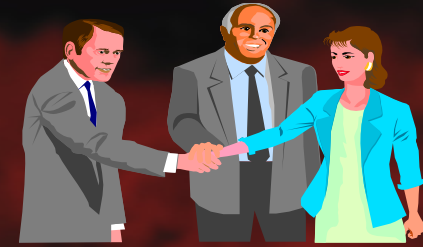
Protected Area (1): \$450

Semi-Protected Area (2): \$736 (64% more than 1)

Unprotected Area (3): \$1,396 (210% more than 1)



FUS Ratings Summary of Benefits



1. Provides objective countrywide fire protection grading standard
2. Helps insurers to manage exposures to loss and to price business appropriately
3. Helps communities to plan, budget and justify improvements in water supply, fire department and fire prevention to reduce life and property losses. (On average over the last 10 years there have been over 60,000 fires, over 400 fire deaths, 3,000 injuries and over \$1.2 billion in dollar losses per annum)
4. Helps property owners gain access to the wider Insurance Market
5. Cost benefit to those communities that have a recognized grade
6. FUS gradings strengthen the relationship between all stakeholders including the leaders, the community, the insurance industry and others
7. FUS recommendations result in millions of dollars of fire defense infrastructure improvements every year



Expertise

- Fire Underwriters Surveys can be performed for a low cost to provide updated information to insurers only
- Alternatively, Fire Underwriters Surveys can be performed for an increased cost to provide detailed recommendations on how communities can improve their grade and clearly identify where their weaknesses are
- Detailed surveys can also be used as a road map providing the community with direction for the future of the Fire Protective Services



Benefits

- Benchmarks of Fire Protection are established
- Access to the wider Insurance Market (competition)
- Cost benefit to those communities that have a recognized grade
- Important tool for long term planning
- Increase emphasis on Fire Prevention
- Increased life safety



Action Plan

- Agree on level of service to be provided
- Determine necessary funding
- Identify and hire additional surveyors
- Set up a data base using online forms
- Collect data
- Develop a survey schedule according to a Risk Management Plan
- Implement



Thank you

Fire Underwriters Survey