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MODELS IN FIRE PREVENTION

SYMPOSIUM 2012

Inspection, Testing and Maintenance of Fire Protection Systems: Managing the Qualifications of Contractors and their Employees

David M. Smith

Vancouver Fire Department

Background

- Enforcement changes: 1997 UFC to 2003 IFC
- Deputy Fire Marshal's began requesting copies
- More time spent reviewing reports
  - Deficiencies were found during regular inspections that weren't noted on reports
  - Deficiencies noted weren't being repaired
  - Quality of some reports provided little "confidence"

Background

VISUAL
SPEAKERS
VOICE CLARITY

INITIATING AND SUPERVISORY DEVICE TESTS AND INSPECTIONS

LOC. & S/N	DEVICE TYPE	VISUAL CHECK	FUNC-TIONAL TEST	FACTORY SETTING	MEAS. SETTING	. PASS	FAIL
		[ ]	[ ]			[ ]	[ ]
		[ ]	[ ]			[ ]	[ ]
		[ ]	[ ]			[ ]	[ ]
		[ ]	[ ]			[ ]	[ ]
		[ ]	[ ]			[ ]	[ ]

COMMENTS: ___ No deficiencies found at this time
Smoke detectors in elevators tested and noted on check list in the
elevator room.
Company monitoring the fire alarm system,

Figure 7-5.2.2 Inspection and Testing Fo

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GOALS AND OBJECTIVES

Goals

- Increase knowledge level for technicians
- Create means for local enforcement
- Establish means to verify systems are tested
- Develop program contractors would support

- Indirectly - improve reliability of systems
  - Decrease of fire loss in buildings with fire protection systems
  - Decrease of false alarms

FORMATIVE EVALUATION

Evaluation & Research

1. Quality of work performed in community
   - Enforcement options
     - Double permit fees, electrical licensing authority only regulates electrical portion of installation, state fire marshal's office could only intervene for licensed sprinkler contractors
   - Initiated discussions with contractors and business owner's
     - Is community getting what they pay for
     - How can we educate community
     - What are reasonable enforcement actions
   - Anecdotal and recent experience

Evaluation & Research

Kitchen suppression system failed to operate

Sprinkler contained fire that escaped kitchen hood

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Evaluation & Research

Debris found in sprinkler that operated; obstructed stream remained effective

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Evaluation & Research

- Quality of work
  - Limited enforcement options
  - Simultaneously industry was advising
    - They could see quality issues
    - Wanted a "level playing field"
    - Desire for minimum certifications for individuals
    - Need to prevent contractor from having employee do something they know they shouldn't
  - Focused efforts on a comprehensive program

Evaluation & Research

2. Reviewed model practices and programs in place regionally as well as nationally

3. Identified model certification programs

4. Verifying fire protection systems tested & maintained by endorsed individuals

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PROCESS EVALUATION

Implementation

- Involved key stakeholders
  - Periodic meetings early on
  - Quarterly meetings with each industry
  - Personal discussions
  - Newsletters
  - Draft documents sent out with comment forms
- Contractor Endorsement Program – 4 years
  - Adopted as ordinance in May 2007
  - Enforcement began in July 2009

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Implementation

- Contractor Endorsement Program highlights:
  - Individual & company must possess endorsement
    - Obtaining individual endorsements require minimum industry certification; managed via administrative rule
  - Requires at least one person with endorsement be on site "supervising" the work
  - Contractors must submit copies of inspection/test reports within 30 days of the service date
  - Provided local enforcement options on contractor, individual or both
  - Adopted NFPA 96 locally

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Implementation

- Ordinance passed
- Updated internal processes, training & database
  - Issuing and verifying individuals endorsements *
  - Routing and turnaround times of submittals *
- Adequate notification to community
  - Wide distribution – unknown how many contractors didn't participate in earlier planning phase
  - Prevent plan submittal delays
  - Test reports not accepted; requiring follow up *

* Indicates quantifiable impact; no previous data

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Benchmarking

- Established baseline values for future evaluation purposes
  - Determined percentages of time spent on existing inspection activities
  - Current false alarm rate due to improperly maintained fire protection systems
  - Number of occupancies that have protection systems and no record of a report

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Changes in Staff Time Allocation

Year	Communication	Contractor Endorsment Program	Document Submittals	Fireworks	Inspection, Testing & Maint.	Legal	Other	Regular	Special	Grand Total
2001	1%	0%	0%	0%	1%	0%	0%	80%	17%	100%
2002	0%	0%	0%	0%	6%	1%	0%	73%	21%	100%
2003	1%	0%	0%	0%	0%	0%	0%	83%	15%	100%
2004	0%	0%	0%	9%	35%	0%	0%	34%	22%	100%
2005	1%	0%	0%	0%	3%	0%	0%	86%	10%	100%
2006	1%	0%	0%	0%	4%	1%	1%	77%	16%	100%
2007	1%	0%	0%	0%	4%	0%	0%	80%	14%	100%
2008	1%	0%	0%	0%	3%	0%	2%	90%	4%	100%
2009	6%	2%	1%	0%	7%	0%	0%	77%	8%	100%
2010	12%	2%	1%	1%	23%	0%	0%	48%	13%	100%
2011	14%	4%	0%	0%	11%	0%	0%	59%	12%	100%
2012	8%	3%	0%	0%	12%	0%	1%	70%	7%	100%

- Between 2008 and 2010,
  - Time spent on regular "round the block" inspections dropped from 90% to 48%
  - Time spent on IT&M report reviews increased from 7% to 23%
  - Time was also redirected to Communications and handling program applications

NOTE: Percentages based on existing occupancy activities only, new construction & fire investigation related activities are not included
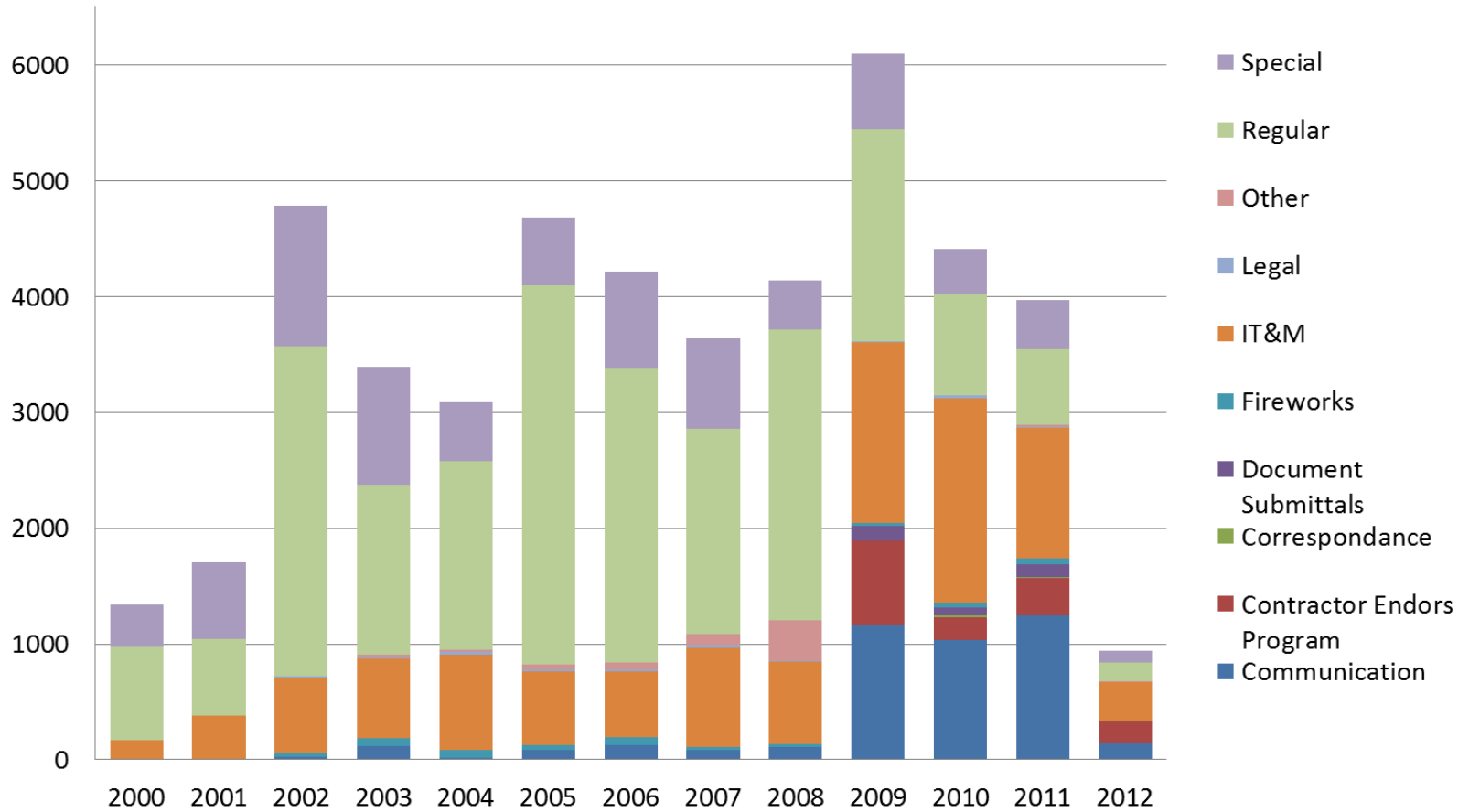
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IMPACT EVALUATION

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Short Term Results

- Anecdotal experience identified significant changes after the implementation date
  - Multiple floors of a building tested by endorsed contractor found inoperable notification appliances; previously noted okay by contractor unable to obtain endorsement
  - Decrease in new construction inspection trips
  - Large amount of fire alarm batteries failing load test
  - Obstructed sprinkler pipes

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Comparison of Change in Inspections Completed by Category

Quantity of Legitimate Violations Identified by Submitted Test Report Type

Legend:
- Sprinkler - Standpipes
- Emergency Generator
- Sprinkler - Fire Pumps
- Private Water Mains
- Fixed Suppresion Systems
- Commercial Cooking Suppression System
- Fire Alarm Systems
- Commercial Cooking Hood Cleaning
- Sprinkler Systems

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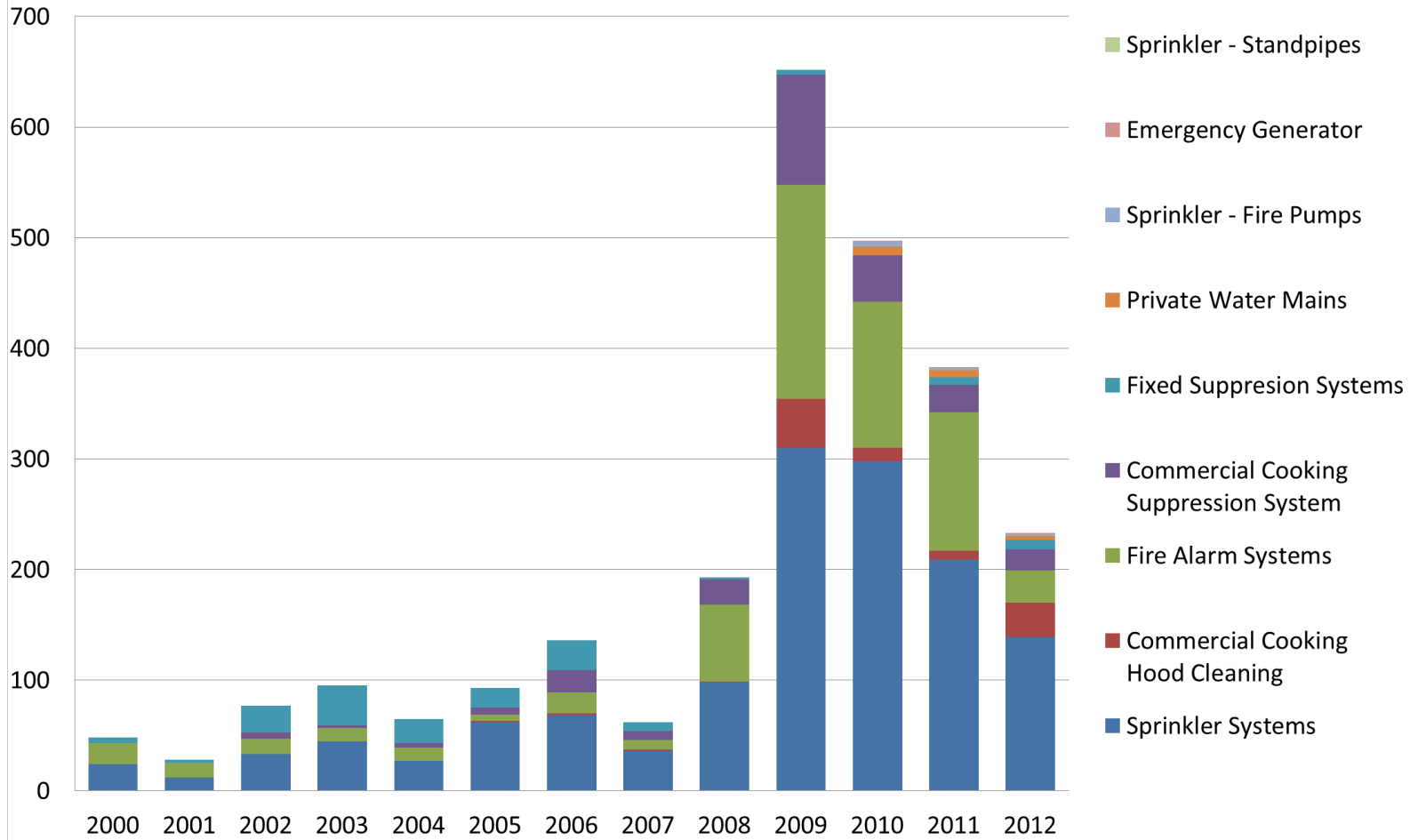
Violation Example

Internal pipe inspection identified debris and sludge in 4" and 2" diameter pipes

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Violation Example

Items removed during FDC back flush

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	Building 1			Building 2		
Year of Inspection	2010	2011	Site Visit	2010	2011	Site Visit
Number of Circuits	12	8 zones 1 NAC		12	7 zones, 2 NAC	
Alarm Initiating Devices						
Manual Pull Stations				6	5	6
Ionization Detectors		1	1		14	22
Photoelectric Detectors				19		
Heat Detectors				8	5	7
Waterflow Switch	1	1	1			
Supervisory Switch	5	2	2			
Other (specify)	1	2	2			
		1 pressure/1 low air				
Alarm Notification Devices						
Bells	1	1	1			
Horns				**6**		
Horns (horn/strobe)		1	1		**6**	**12**
Chimes						
Strobes				**12**	**4**	**2**
Speakers						
No. of Circuits	4	2	2 installed	4	2	2 installed
				[18]	*[10]*	*[14]*
Supervisory Signal - Initiating Devices						
Building Temp.	1	N/A		N/A	N/A	

Different Device Totals

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Longer Term Results

- Increase in number of test reports submitted – number not doing tests on annual basis
- Change in violations noted on submitted reports
- Decrease in work done by contractors without endorsements
- Improved overall quality
- Decrease in false alarms
- Improved dollar losses

Violations Counts by Code/Standard and Individual Section

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Grand Total
2003IFC	**1**	**27**	**74**	**82**	**39**	**7**	**36**	**22**	**6**	**2**	**242**
IFC 2006				**10**	**16**	**126**	**464**	**217**	**33**	**11**	**765**
IFC 2009								**172**	**129**	**91**	**376**
NFPA						**3**	**132**	**231**	**223**	**141**	**671**
05.02.01 - Sprinklers - Inspection							10	30	22	16	70
13.02 - Obstruction Investigation and Prevention							2	15	41	14	66
12.04.02.01 - Check Valve Inspection							12	19	35	10	65
04.04.01.08.03.01 - Battery							10	29	18	2	59
04.06 - Maintenance							1	6	6	19	31
05.04.01 - Sprinklers								5	19	4	27
14.2.1.2 - Impairments								5	15	6	26
08.5.1.1 - Sprinkler Spacing							4	9	3	3	19
12.07 - Fire Department Connections							6	10	2	1	16
10.4.3.2 - Sensitivity Testing								10	5	1	13
6.2.9 - Spare Sprinklers							10	3			13
05.03.01 - Sprinklers - Testing							3	1	5	3	12
06.02.07.1 - Escutcheon Rings							1	6	3	3	12
4.4.1.4.2 - Fire alarm banch circuit.							1	5	5		10
7.5.1 - Hydrostatic Testing							2	7	3		10
5.12 - Detection of Automatic Exinguishing Systems							1	5	1	3	9
04.04.01.05 - Secondary Power Supply							4	5	2	1	9
04.04.05 - Protection of Fire Alarm Control Unit(s						1	6	2	1	1	9

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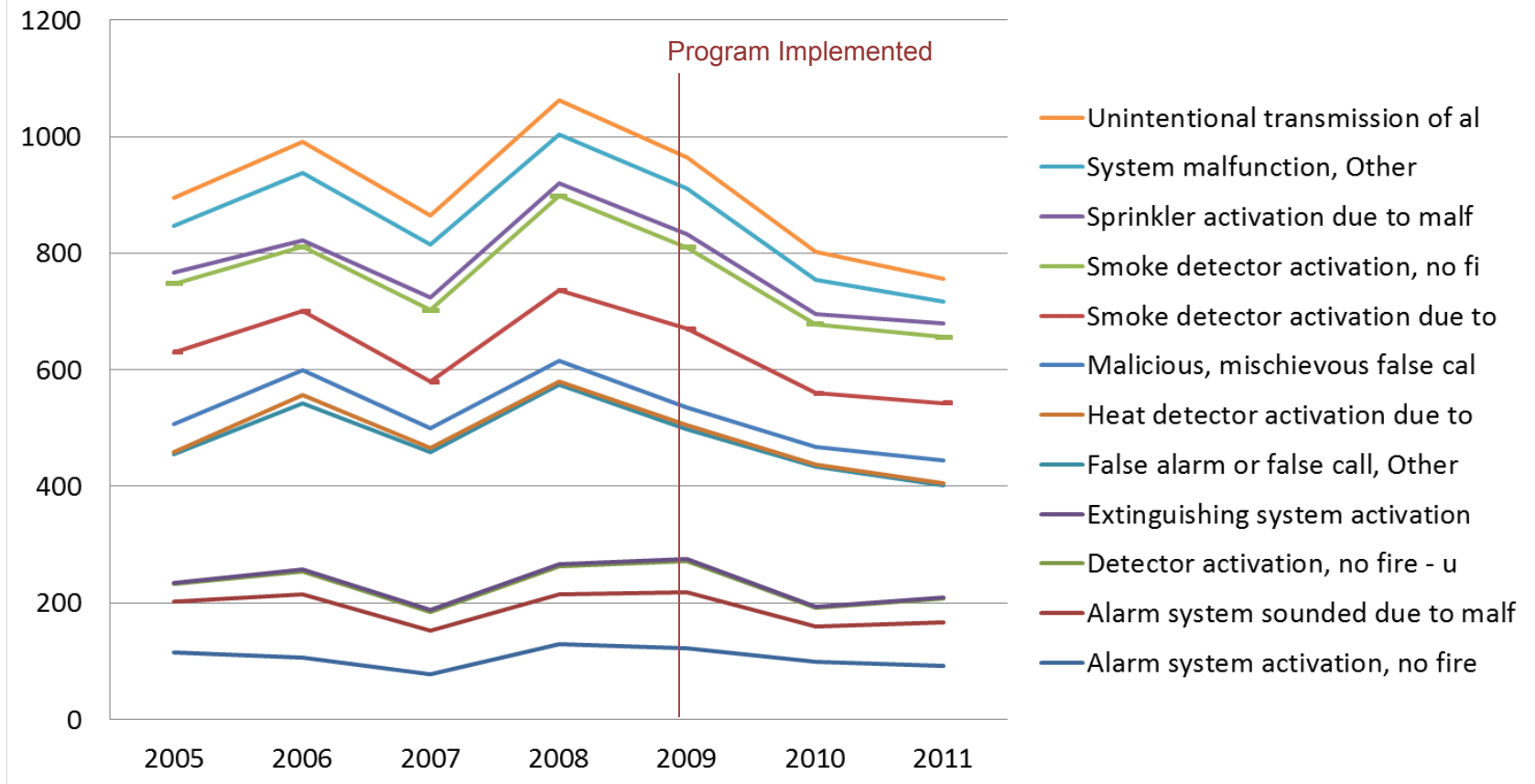## MODELS IN FIRE PREVENTION
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OUTCOME EVALUATION

Incident Type Response Comparison by Year (NFIRS 700's)

Program Implemented

Legend:
- Unintentional transmission of al
- System malfunction, Other
- Sprinkler activation due to malf
- Smoke detector activation, no fi
- Smoke detector activation due to
- Malicious, mischievous false cal
- Heat detector activation due to
- False alarm or false call, Other
- Extinguishing system activation
- Detector activation, no fire - u
- Alarm system sounded due to malf
- Alarm system activation, no fire

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Loss Comparison: All Structure Fires When Sprinkler System Activated
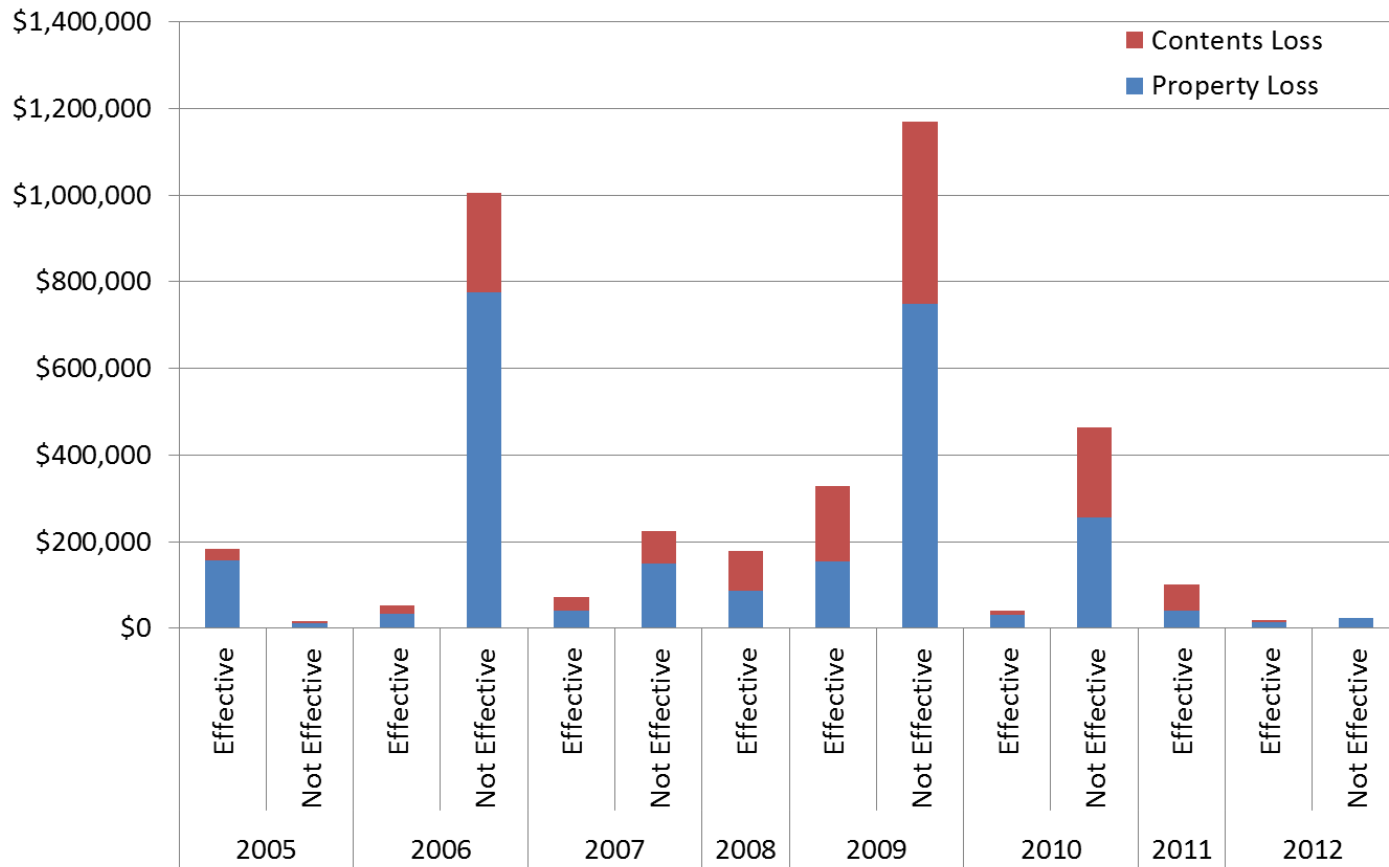
"Cleaned" by non-endorsed contractor on 1/2/12 and caught on fire 1/10/12

RECOMMENDATIONS

Recommendations

- Stakeholders – primarily contractors
  - Identify stakeholders and develop avenues for disseminating information
  - Maintain open, honest, frequent communication with stakeholders
  - Allow stakeholders a means to provide feedback

- Community
  - Identify influential business owners; educate them on issues
  - Develop and provide educational material
  - Contractors will disseminate information with their customers

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Recommendations

- Political impact
  - Prepare and educate local policy decision makers

- Internal processes
  - Clearly define internal business processes
  - Prepare for changes in workflow
    - Changes in activity codes
    - Training needed on data collection
    - Provide information on website and update regularly

It's not a perfect system

- Human involvement (error) still exists

A single sprinkler head contained a small fire; when monitoring company did not notify fire dept., the water filled the basement for several hours.

RESOURCES

Reference Material Available

- Documents (.doc format)
  - Adopting Ordinance – fits within 2009 IFC *
  - Administrative Rule 9.01 – outlines requirements for obtaining each individual endorsement type
  - Administrative Rule 9.02 – interpretation regarding internal employees
  - Frequently Asked Questions
  - All necessary contractor and individual applications
  - Service report examples (fire alarm, kitchen hood)
- http://www.vanfire.org
  - Fire Marshal > Fire Protection Contractors

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Reference Material Available

- Documents (.doc format)
  - Public Information Bulletins
    - General IT&M Requirements for all Fire Protection Systems
    - Automatic Fire Sprinkler System IT&M Requirements
    - Fire Alarm System IT&M Requirements
    - Metal Thieves Target Fire Protection Equipment: Advice for Building Owners
  - Contractor selection guides
    - Selecting a Commercial Kitchen Hood/Duct Cleaning Provider
    - Selecting a Fire Alarm Service Provider
    - Selecting a Fire Sprinkler Service Provider

- http://www.vanfire.org   Fire Marshal > Business Owners

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Reference Material Available

- For Firehouse Software Users, multiple files can be provided in .fhz format for installing
  - Occupancy User Fields
  - Inspection/Activity Lookup Codes
  - Inspection/Activity User Fields
  - Data Export Query & Corresponding Excel File (for those users not using FH Analytics)

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