ANNUAL REPORT REGARDING FINDINGS IN CONDUCTING LIFE SAFETY INSPECTIONS

FY 2016

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Highlights

- In the 84th Legislature, Senate Bill 1105 increased the inspection requirement and reporting to cover all state agency owned or leased buildings. Prior to SB 1105, the state's legislatively mandated inspections of facilities controlled and leased by Texas Facilities Commission (TFC) covered only 6 percent of state-owned and leased buildings and 4 percent of all state-owned and leased square footage.

- The State Fire Marshal's Office (SFMO) has improved its inspection processes and documentation of violations. This has resulted in an increase in the number of violations documented due to a more thorough inspection process and more accurate inspection reports. This will make risk assessments more accurate; however, it also makes comparing the number of violations identified before and after the change misleading.

- As reported in the previous two years, an unsafe locking arrangement for bathrooms is still being resolved by some universities.

- A lack of funding continues to be the primary response by inspected entities as to why deficiencies have not been resolved.

- As previously reported, additional buildings continue to be identified for inspection by SFMO. SFMO is working with other state entities, particularly university systems, to establish a reporting system that notifies SFMO about new construction. HB3750 passed last session will be very helpful in creating and maintaining a comprehensive list of state buildings.

- Life safety inspections continue to find persistent violations of safe practices in the use of extension cords and power strips and have identified a disturbing trend for fire wall penetrations.

- Problems with 400 detention units under the Texas Department of Criminal Justice (TDCJ) previously identified as lacking working fire alarms are still unresolved. Some systems reported as having been fixed were found to still be deficient.

- Texas School for the Deaf and TFC have worked to bring the campus into compliance.

- SFMO continues to face challenges to compile accurate data due to limitations with the current agency database. SFMO is working with TDI to change to a more modern fire inspection software, which will provider easier access to accurate data and improve the time it takes an inspector to document findings. We estimate this $250,000 investment would increase Inspections Section's efficiency by at least 30 percent and also would benefit other SFMO sections.

Background

Texas Government Code, Section §417.0081(c), requires the SFMO to submit an annual report to the Governor, Lieutenant Governor, Speaker of the House of Representatives, and appropriate committees of the legislature about the State Fire Marshal's inspection findings. This report responds to that requirement.

SFMO has been inspecting state-owned properties for decades and inspecting buildings leased by the state since 2012 under this authority. The greater part of this report will address the fire safety status of state-owned and state-leased buildings under the charge of TFC. This report also includes information on the inspection of state-owned buildings not under the control of TFC. This authority was clarified in the 84th Legislature by Senate Bill 1105. SFMO's goal is to ensure that all state-owned and state-leased buildings provide a safe environment for state employees and the citizens they serve.

Fiscal Year 2016 marks the fourth full year that SFMO has conducted legislatively mandated inspections in state-leased buildings. These inspections were prioritized and conducted on a risk analysis basis developed in consultation with TFC and the State Office of Risk Management (SORM).

During this same reporting period, 11 percent of SFMO inspections were performed for a fee (as authorized by statute) of certain non-state-owned facilities as authorized by Government Code, Chapter §417.008(f), and the Texas Administrative Code, 28 TAC §34.340.

SFMO began using the 2012 edition of National Fire Protection Association (NFPA) Life Safety Code (NFPA 101) in 2012. The 2012 edition of NFPA Fire Code (NFPA 1), was adopted in 2015. SFMO and TDI are in the process of adopting the 2015 editions of NFPA 1 and NFPA 101.

The State Fire Marshal uses other NFPA codes and standards for guidance in assessing and directing remediation of fire and life safety hazards. These codes are updated on a regular cycle and SFMO is in the process of updating the adopted editions of these standards to their current year version. This code adoption action is taken under the

authority of the Texas Government Code, §417.008 and §417.0081, and the Texas Administrative Code, 28 TAC §34.303.

The top 10 violations continue to be similar to previous years. As SFMO conducts these inspections, compliance and education are the primary focus in resolving the violations of these important life safety principles. Some of the violations indicate that tenants are either not aware that they are committing a violation or were not properly oriented at their initial hiring.

Top 10 Life Safety Code Violations in State Buildings

- Lack of annual inspections of fire alarm and fire sprinkler systems, and systems that have either been red- or yellow-tagged for years.
- Key operated locks in conjunction with panic hardware.
- Inoperative exit signs and emergency lighting units, or lack of exit signs and emergency lighting.
- The use of swipe cards to exit a building and lack of motion sensor or button to allow egress.
- The use of extension cords and the improper use of power strips.
- Stairwell doors missing latching hardware or equipped with panic device hardware when fire exit hardware is required.
- Exit signs missing or not directing occupants to the correct path of egress.
- Unrated elevator corridors.
- Penetrations of firewalls without sealing the penetrations. This can cause unimpeded fire spread and make the sprinkler system less effective.
- The lack of ground fault circuit interrupters (GFCI) on vending machines, water fountains, and within 6 feet of sinks within countertops.

Executive Summary

To achieve full compliance with fire and life safety standards in TFC-owned and managed buildings, SFMO continues to work with TFC and SORM to educate and change the behavior of tenants not complying with life safety standards. In addition to documenting code violations, SFMO also notifies TFC of any violations of TFC's tenant manual that are observed during the inspection.

While funding continues to be a challenge to remediating inspection findings of state properties, SFMO works with TFC to prioritize inspections of facilities and identify deficiencies that pose the greatest risk. This is done to ensure that available funds are spent as effectively as possible to identify and resolve life safety risks.

SFMO's efforts in the inspection of TFC-leased spaces have continued to be successful in identifying and resolving life safety risks. This success has been amplified by early coordination with local authorities having jurisdiction (AHJs), as well as cooperation from TFC, and has led to an effective process for inspecting leased buildings and enforcing the adopted NFPA codes. SFMO continues to collect the data and information it needs to develop a comprehensive risk-ranking program similar to the one used to schedule inspections for TFC-owned facilities. SFMO collects most of this data during the inspection process and uses it to more effectively prioritize scheduling of subsequent inspections.

It is important to note the difference between obtaining compliance to the adopted NFPA codes in state-owned buildings versus its application in TFC-leased buildings. SFMO has clearly defined enforcement authority, embodied in statute, in state-owned buildings. Privately owned buildings, leased by the state, are subject to local building and fire ordinances and contractual obligations, whereas state-owned buildings are not. SFMO continues to work with TFC, SORM, and occupying state agencies to make the most effective use of the resources available; and to ensure that leased buildings are a safe environment for state employees and the public. Many building owners have corrected issues once they are made aware of the risks for the safety of state agency tenants and other tenants.

As first described in the *2012 Annual Report Regarding Findings in Conducting Inspections*[1], SFMO

has determined that 14 years is an excessive length of time for any building to go without an inspection. More frequent inspections help prevent fires[2]. SFMO's goal is to inspect all facilities every five years. In 2016, SFMO made significant improvements to its inspection processes and documentation of violations. This has resulted in an increase in the number of violations documented due to a more thorough inspection process and more accurate inspection reports. For example, under the old process a building-wide violation, such as a lack of proper exit signs, was documented as a single violation. Under the new process, the inspector documents each instance of that violation within a building. This more thorough review, combined with information on the severity of each violation, results in more accurate risk assessments for buildings. However, the change means most buildings will see a significant increase in the number of violations reported the first time they're inspected using the new process. This means care must be taken when comparing the number of violations identified before and after the change. For example, the number of violations identified in the William P. Hobby Building in Austin increased from more than 100 to more than 800 violations using the new process. (It should be noted that the Hobby Building's risk ranking is expected to be dramatically lower once it has been re-inspected because of the significant improvements and repairs that have been made over the past two years.)

SFMO conducted 2,129 inspections encompassing 7,941 individual structures in FY 2016. This compares with 2,049 inspections encompassing 8,210[3] individual structures in FY 2015. SFMO identified 7,287 hazards in FY 2015, as compared with 16,095 hazards in FY 2016. As noted above, this spike is primarily due to SFMO's move to a new inspection process. The State Fire Marshal's Office has identified 2,434 locations[4] owned or occupied by State of Texas agencies. However, a location may have more than one separate structure to be inspected. SFMO estimates that there may be as many as 16,000-19,000 individual state-owned or state-occupied structures. Because there is no comprehensive database of state-owned properties, SFMO continues to collect information during each inspection to update its list of individual buildings[5]. It should be noted as a result of HB3750 during the 84th Legislature, a mandate was placed on the Legislative Budget Board (LBB) in conjunction with SORM, to develop a list of all real estate owned by the State of Texas and to report the findings. This list should help clarify the number of buildings that need to be inspected.

A recurring theme throughout this report is the availability of useful data[6]. Information

provided for inspections is based on findings that are anecdotal because SFMO's inspection database does not permit queries for details on inspection findings and enforcement rates. SFMO is seeking to buy a software program for its Inspections Section that would enable SFMO to track detailed inspection finding information and compliance rates. In addition, an updated inspections database would make the execution of SFMO's risk analysis and ranking systems more efficient and accurate.

Historically, information on the number and types of state-owned and state-leased buildings has been compiled from multiple sources and has varied in detail. One of the continuing issues with scheduling inspections of TFC-leased spaces on a risk-based priority is that the information available on these facilities is sparse and often outdated. Therefore, SFMO collects detailed information useful for a risk analysis after inspecting the site. This results in an inefficient and tedious manual review of the data, using a database that was created in 1999.

In addition to benefiting the Inspections Section, an updated inspections database would improve documentation and data collections by the Fire/Arson and Licensing Sections. Currently SFMO is approximately one year behind knowing the exact locations of firework stands throughout the state. SFMO issues permits to distributors, who sell the permits to stand operators. SFMO receives the permit funds by March 1 of the following year and the permit information is manually entered into the database. With this system, SFMO documents where the firework stands are located and then sends inspectors out to do an inspection. The Inspector sometimes shows up at the site of a listed location, only to find it is no longer in operation or has moved. An improved database system would allow SFMO to take online payments, instantly issue permits, and know the locations of the stands before sending staff to conduct an inspection.

For a brief explanation of the risk assessment algorithm, see Appendix A.

TFC-Owned Buildings

Working through a memorandum of understanding (MOU) with TFC and SORM, SFMO regularly inspects state-owned buildings and monitors fire safety improvements. Each agency assumes certain responsibilities through the MOU, and the agencies meet quarterly to ensure ongoing cooperation and progress.

In accordance with Texas Government Code, Section §417.0081(b), SFMO schedules periodic inspections of TFC buildings using a risk based approach. SFMO uses a Fire Risk Ranking method to assign buildings a "relative risk" value that is used to determine the frequency of inspection for individual buildings.

SFMO coordinates with TFC building management when scheduling inspections to ensure access to all building areas and necessary equipment. After the inspection is completed, SFMO provides inspection reports to TFC and SORM. SFMO also provides a copy to the heads of agencies occupying the buildings if requested. TFC generates work orders to correct any findings, coordinating with occupants as necessary, or to request additional funding for repairs that may not be possible within its current budget.

Updates on other projects being jointly worked by TFC and SFMO

TFC has concentrated on the most common fire safety issues to ensure that tenants are safe in their workspaces.

1. All annual fire alarm, fire sprinkler, fire suppression and fire extinguisher inspections are logged and current for 2016.
2. A program is in place to ensure KNOX boxes are current and keys and card access are available to first responders.
3. Verification that all fire doors are properly closing and latching during annual fire alarm inspections.
4. A process is in place to repair all known fire penetrations in firewalls.
5. A TFC work order system is used to track all impairments. Minor deficiencies such as "daisy chaining power cords" are quickly repaired by tenants after the SFMO report is generated.

TFC received additional funding for maintenance to help make repairs in all buildings. Below are some of the improvements listed in the past years:

Stephen F. Austin, 1700 Congress Ave., Austin

Critical issues involving FM-200 systems have been corrected and are now compliant with the current code. Major repairs to fire sprinkler systems have been made throughout the building. Fire sprinkler systems will be impairment free by January 2017. Sprinkler heads have been added in rooms without coverage. All annual inspections for fire alarm, fire sprinkler, clean agent suppression, and fire extinguishers are logged and current for 2016.

William P. Hobby, 333 Guadalupe St., Austin

Major repairs to fire sprinkler systems have been made throughout building. Fire sprinkler systems will be impairment free by January 2017. Fire alarm and fire sprinkler systems have been renovated. Annual inspections for fire alarm, fire sprinkler, clean agent suppression systems, and fire extinguishers are logged and current for 2016.

Price Daniel, Sr., 209 W. 14th St., Austin

Major repairs to fire sprinkler systems have been made throughout the building. Fire sprinkler systems will be impairment free by January 2017. Fire alarm and fire suppression systems are impairment free. Fire sprinkler systems will be impairment free by December 2016. Annual inspections for fire alarm, fire sprinkler, clean agent suppression, and fire extinguishers are logged and current for 2016.

Lyndon B. Johnson, 111 E. 17th St., Austin

Major repairs to fire sprinkler systems have been made throughout building. A new fire pump was recently installed. Fire sprinkler systems will be impairment free by January 2017. The fourth-floor fire alarm and fire sprinkler system has been renovated. The building fire alarm panel is impairment free and clear of trouble alerts. Annual inspections for fire alarm, fire sprinkler, clean agent suppression systems and fire extinguishers are logged and current for 2016.

DSHS Dr. Bob Glaze, 1711 San Jacinto Blvd., Austin

Major repairs to fire sprinkler systems have been made throughout building. Fire sprinkler systems will be impairment free by January 2017. Building fire alarm systems are impairment free and clear of trouble alerts. Annual inspections for fire alarm, fire sprinkler, clean agent suppression systems, and fire extinguishers are logged and current for 2016.

William B. Travis, 1701 Congress Ave., Austin

Major repairs to fire sprinkler systems have been made throughout building. Fire sprinkler systems will be impairment free by January 2017. Building fire alarm systems are impairment free and clear of trouble alerts. Annual inspections for fire alarm, fire sprinkler, clean agent suppression systems, and fire extinguishers are logged and current for 2016. Ratings for all exit doors and frames were verified and proven to be listed.

John H. Winters, 701 W. 51st St., Austin

Major repairs to fire sprinkler systems have been made throughout building. Fire sprinkler systems will be impairment free by January 2017. The main building fire panel should clear of impairment tags by October 2016. Re-inspection has not occurred. The large data center's red tagged halon system has been replaced with an up to standard Novec 1230 suppression system. The project will be completed by January 2017. Annual inspections for fire alarm, fire sprinkler, clean agent suppression systems, and fire extinguishers are logged and current for 2016. Installed improved smoke seals and new doors at stairwells in all three buildings. Added smoke separation doors with mag locks between east and west atrium connections.

William P. Clements, 300 W. 15th St., Austin

Major repairs to fire sprinkler systems have been made throughout building. Fire sprinkler systems will be impairment free by January 2017. Annual inspections for fire alarm, fire sprinkler, clean agent suppression systems, and fire extinguishers are logged and current for 2016.

Sam Houston, 201 E. 14th St., Austin

Major repairs to fire sprinkler systems have been made throughout building. Fire

sprinkler systems will be impairment free by January 2017. A new UL listed monitoring system has been installed in the building that monitors all Capitol Complex buildings and the School for the Deaf. Annual inspections for fire alarm, fire sprinkler, clean agent suppression systems, and fire extinguishers are logged and current for 2016.

Tom C. Clark, 201 W. 14th St., Austin

Major repairs to fire sprinkler systems have been made throughout building. Fire sprinkler systems will be impairment free by January 2017. Annual inspections for fire alarm, fire sprinkler, clean agent suppression systems, and fire extinguishers are logged and current for 2016.

Tower Building, 1100 W. 48th St., Austin

As previously reported, the Department of State Health Services' Tower Building was the only high rise in the group of TFC-managed facilities that lacked an installed fire sprinkler system. TFC recently completed the installation of the fire sprinkler system, which cause the building to drop off the list of buildings with high potential risk. As stated in previous reports, sprinkler systems are a crucial part of the overall fire protection scheme in high rise structures.

SFMO and TFC will continue to work closely together to make the most effective use of funds to correct violations within TFC's portfolio of buildings. Recently TFC came to SFMO about a nonfunctioning smoke control system. TFC found it would cost $1.5 million to replace the system. SFMO and TFC evaluated the system and determined that it was not being used as it was designed and could be repaired instead of replaced. By working together, TFC saved $1 million.

It should be acknowledged that these improvements would not have been possible without the additional funding given to TFC by the Texas Legislature for repairs. The TFC project management team has very good oversight and works with SFMO to make each dollar go as far as it can. Additional funding will be needed to resolve other issues with state-owned buildings.

Findings

The following TFC-owned buildings have been identified as having a high potential risk based on SFMO's risk ranking system.

- Stephen F. Austin Building
- William P. Hobby Building
- Price Daniel, Sr., Building
- Lyndon B. Johnson Building
- DSHS Dr. Bob Glaze
- William B. Travis Building
- John H. Winters Building
- William P. Clements Building
- Sam Houston Building
- Tom C. Clark Building

SFMO did not revise the risk rankings from the previous year's report since changes to the inspection process may skew the data until all buildings have been re-inspected using the new process. SFMO's new inspection policy will better reflect the actual improvements to buildings and their actual risk assessment analysis. In addition to the process improvements noted earlier in this report, SFMO also no longer conducts a 90-day re-inspection of a building because this timeframe was found to be too short to correct significant issues. For example, the William P. Hobby Building is expected to be removed from this list once it has been re-inspected due to the significant improvements and repairs that have been made over the past two years.

Still, these buildings have several common features and deficiencies that contribute to their elevated level of risk. These buildings, with the exception of the John H. Winters Building, are high-rise structures that pose a number of unique challenges for life safety and fire protection. These buildings are also all very large buildings with high occupant loads. SFMO inspections have found numerous code violations in these buildings, including compromised fire/smoke barriers, improper locking systems that can hinder egress, and deficiencies in building fire alarms, fire sprinklers, and fire suppression systems.

The top three buildings on this list all feature notable issues that result in significantly higher levels of risk than other state buildings. For instance, the Stephen F. Austin Building has critical issues involving the red-tag of the FM-200 system (waterless fire suppression system that uses inert gasses called clean agents to suppress the fire), rooms without sprinkler coverage, mechanical rooms that lack self-closing devices on every floor, and utility shaft breaches building-wide with large holes in the mechanical room walls on every floor. Penetrations within the fire walls would allow a fire to travel unimpeded through firewalls and fire-rated floors, making fire protection features less effective.

Complete fire sprinkler systems and complete fire alarm coverage are essential elements of fire protection and occupant safety. However, their performance is degraded and the efficiency of evacuation of a building is diminished when these systems are tagged with deficiencies and there are numerous obstructions to egress, non-functioning fire doors or non-rated doors where fire doors are required, and firewalls with unprotected penetrations.

Consistent, ongoing building maintenance, while ensuring that contractors finish their work correctly and to the required standards, greatly influence the building's overall life safety. Major building services violations and egress problems can cause a building's life safety properties to deteriorate, regardless of the presence of sprinkler systems or fire alarms.

The most prominent issues related to state employees' actions throughout state-owned buildings include the potentially unsafe use of extension cords, power strips, and food warming and cooking equipment. According to statistics from the National Fire Protection Association, electrical distribution and cooking equipment are identified as the source of nearly a third of all office property fires[7].

As stated in previous reports, cooking equipment is a leading cause of fires in the workplace, accounting for 29 percent of fires identified in office buildings[8]. Cooking and food warming equipment should only be present in designated areas. A third of all office fires originating from cooking equipment occurred outside of a kitchen or designated cooking area. Workspaces often contain combustibles that create potential for ignition and can contribute to the severity of a fire incident.

The second leading cause of fires in office spaces is electrical distribution equipment. Building electrical systems and equipment are designed for specific maximum loads. When the design loads are exceeded, wiring and other components can overheat and start a fire. The most common finding during SFMO inspections is interconnected power strips and extension cords. Occupants typically do this to increase the number of receptacles available for use and extend the reach of the power strip. Doing so places a strain on the building's electrical system as well as on the power strips themselves. There have been a number of recent events in state buildings where an overloaded power strip has failed.

Extension cords are also commonly used to provide power to appliances in areas of an office where there is no nearby receptacle. Extension cords are not designed to be under permanent electrical load and should not be used in the place of permanent wiring. When additional receptacles are consistently needed in an area, building management should be contacted to install the proper fixtures. The use of cooking equipment and other personal electrical appliances that draw large current loads, such as personal refrigerators and space heaters, may also contribute to electrical distribution fires. Office building electrical systems are designed for a specific load that typically consists of computers, printers, and other related office devices. When occupants have their own coffee pots, heaters, and other appliances, the design loads for the office may be exceeded and could cause stress on the building's electrical system over time. This is a significant fire risk that needs improvement.

Inspectors continue to find power strips plugged into uninterruptable power supply (UPS) devices. This arrangement is not only improper for the power strip, but may defeat the purpose of the UPS and the surge suppression of the power strip.

Increased numbers of electrical devices in individual work spaces contribute to an overall increase in the ambient temperature, thus taxing air conditioning and heating systems. As a consequence, TFC may be in a continual battle to provide a comfortable working environment. Overall, this creates an increased cost of operations for the buildings and an increased expense to the state.

However, more significantly, each electrical connection increases the potential for heating on the electrical cord to occur. Each connection increases resistance and the overall load on the electrical system. Resistance heating is a well-known mechanism by which fires are started,

and circuit breakers and other protective devices cannot tell the difference between "good" resistance and "bad" resistance heating.

Obtaining compliance in this area continues to be a challenge due to the lack of employee education on these issues, turnover in agencies and agency personnel, and the frequent reconfiguration of office spaces. SFMO, TFC, and SORM have worked together over the past several years to develop programs to address these tenant issues. SORM has produced a video on workplace fire safety that is available on the internet. The video may prompt employees to evaluate their individual work areas and make changes where necessary. TFC has also recently updated its tenant manual to add information about the proper use of electrical utilities and the misuse of unauthorized appliances. SFMO has included more detailed information on tenant-related issues in inspection reports so that TFC can notify leadership of tenant agencies about life safety code violation issues. TFC will copy SFMO and SORM on these notices, so that SFMO can follow up with agency leadership to help achieve greater compliance. In addition, SORM will copy SFMO and TFC as needed on their reports, informing them of identified life safety code violations. Timely correction of code violations in TFC-owned and managed buildings has been a challenge. SFMO seeks to obtain compliance with correction of deficiencies through communication with and education of the affected agency's stakeholders.

A good example of how effective cooperation can improve a building's safety is the William P. Hobby Building in Austin. Previous inspections identified numerous issues, including fire alarm and fire sprinkler systems with both yellow and red tags, some dating back seven years or more. The fire alarm and sprinkler systems inside the Hobby Building are now in compliance. Although some findings remain unaddressed, the building is on its way to having previously recorded violations corrected. This is due to a cooperative effort of the Commissioner of TDI, SFMO, and TFC to fix the building and make it an example of safety for the occupants.

When those cooperative efforts fail, however, SFMO has only one option to gain compliance. State law allows SFMO to issue an order requiring anything from remediation up to and including closure of a building, but enforcing the order may require assistance from the Office of the Attorney General for an injunction. Local fire authorities often have additional remedies, such as the ability to assess a fine, to bring a building into compliance.

SFMO and TFC continue to work together on all buildings in their portfolio. SFMO inspectors and TFC have walked through several different buildings to clarify violations for TFC and to also work with TFC on alternatives for correction of the violations.

TFC-Leased Buildings

In the 2012 report, SFMO identified a number of potential challenges involved with the inspection of leased buildings.

The risk-related information available on state-leased buildings continues to be limited, making it impractical to schedule inspections on a comprehensive risk-based basis. SFMO continues to schedule initial inspections of the leased inventory with priority given to spaces with the largest amount of leased square footage, and those buildings located in the geographical area of other inspection priorities. As the inspections are conducted, SFMO collects more information on the buildings, as well as inspection findings to be incorporated into the risk based method for prioritizing further re-inspections, once the entire inventory has been inspected.

When conducting an inspection of leased property, SFMO inspectors contact the local authority having jurisdiction. The inspectors generally find good acceptance of their activities by the local jurisdictions with established fire codes. Where issues arise as a result of deviation between codes used by local and state inspectors, there have been no major conflicts with local code enforcement officials. Generally, SFMO's standard of inspection has requirements more stringent than locally adopted codes. This is often due to local jurisdictions having been delayed in adopting newer versions of the nationally recognized codes. It should be pointed out that these situations have historically been resolved with the local authority without conflict.

While the mandatory inspection of TFC-leased facilities has resulted in an increased workload, adding more than 10 million square feet of inspections to SFMO's list of regularly conducted inspections, SFMO inspectors continue to schedule these new inspection duties around existing responsibilities and other annual and ongoing inspections.

Many buildings leased by TFC for state agencies contain other tenant areas as well. SFMO has limited its primary inspections to the actual space occupied by state agencies and does not inspect areas occupied by other tenants. SFMO inspects each building's fire protection systems and means of egress features used by state agencies that may be outside of the space that they occupy, such as stairwells, corridors, and exterior exit doors.

Texas Government Code, Section §417, directs SFMO to prioritize inspections of TFC-leased facilities using a risk based methodology. Fire risk assessments require detailed data and information to be effective. The current information available from TFC on the leased building inventory is limited and is not conducive for use in a fire risk ranking system or other risk assessment methodologies. SFMO continues the inspection of the entire leased building inventory while collecting detailed information on each building in the process. This information will be incorporated into a database and fire risk ranking system that will be used for prioritizing future re-inspections of leased facilities. This risk ranking system will be similar to the one used for TFC-owned and managed buildings.

TFC has agreed to advise SFMO when a lease is being renewed, an agency is seeking new quarters, or when new space is needed. This allows SFMO to inspect prospective properties before a lease is signed and will help determine a schedule for re-inspecting the buildings. Additionally, TFC has strong contract language that allows the state to terminate the lease should life safety issues not be addressed by the building owner. Similar language is not generally present in other state agency or university leases, and SFMO recommends that all leases by other state agencies include this provision.

Findings

SFMO inspectors have found that routine maintenance of life safety features and equipment has been lacking in most leased facilities, despite the fact that many of these buildings are subject to inspection by local jurisdictions. Often the local authority lacks adequate resources to conduct the inspection.

These deficient life safety features and systems include fire alarm systems, fire sprinkler systems, portable fire extinguishers, fire doors and door closers, emergency lighting facilities, and illuminated exit signs. The Life Safety Code requires the periodic inspection, testing, and maintenance of these systems to ensure that they will operate effectively when needed. The improper use of electrical systems by tenants (extension cords, interconnected power strips, etc.) also is widespread, similar to the challenges faced in TFC-owned and managed facilities. A list representing top life safety code violations found by SFMO inspectors in state buildings appears on p. 4 and would also apply to leased facilities.

When problems are found during inspections, TFC provides written notification to building

owners that they may be in violation of the terms of their lease unless the items noted in SFMO's report are satisfactorily addressed. SFMO inspectors also provide a copy of their findings to the local authority.

If an owner does not provide a timely response or address the noted fire and life safety issues, TFC will issue an official notice of default and may terminate the lease if the owner continues to be uncooperative. Most owners have been cooperative and have addressed any SFMO inspection findings in a timely manner. There have, however, been a few facilities with major life safety issues that have resulted in relocation of state employees to other facilities.

The enforcement of NFPA 1 has been successful in these facilities. Correcting issues helps private building owners avoid termination of their lease by TFC and may help them avoid fines from local code officials.

State-Owned Buildings Not Under the Control of TFC

Although Section §417 of the Texas Government Code grants SFMO the authority to inspect buildings "under the charge and control of the Texas Facilities Commission," it is important to note that not all state-owned buildings are under TFC's control. The 84th Legislature, in SB 1105, extended the inspection and reporting of inspection of state buildings to all state buildings. Some examples of these buildings include buildings housing the following agencies:

- State college and university systems
- Texas Department of Transportation
- Texas Department of Public Safety
- State Preservation Board
- Texas Historical Commission
- Texas Workforce Commission
- Teacher Retirement System
- Employees Retirement System
- Texas Parks and Wildlife Department
- Texas A&M Forest Service
- Texas School for the Blind and Visually Impaired
- Texas School for the Deaf
- Texas Department of Criminal Justice
- Texas Juvenile Justice Department
- Texas Military Department
- State supported living centers and hospitals
- Finance Commission of Texas
- Texas Board of Professional Engineers
- The Alamo

Buildings under the control of TFC represent only a small portion of state-owned buildings. According to its 2016-17 Legislative Appropriation Request, TFC maintains 17.8 million square feet of state-owned properties and 800 leases comprising 10.3 million square feet of leased properties[9]. Based on data collected from the General Land Office, Department of Public Safety, Department of State Health Services, Department of

Criminal Justice, Parks and Wildlife Department, Department of Transportation, and Texas Higher Education Coordinating Board, there may be as many as 19,000 individual, state-owned buildings totaling more than 303 million square feet. During previous inspections of state buildings, it was often found that a single address listed for an agency might encompass many individual buildings.

SFMO has regularly inspected only a portion of these buildings, including state universities, state supported living centers, state hospitals, Texas Department of Criminal Justice (TDCJ), Texas Juvenile Justice Department (TJJD), and certain state preservation board facilities, including the Capitol. More than 12,000 individual buildings are inspected on a recurring basis.

Other agencies' facilities have undergone inspections on a one-time basis, including the Texas Board of Professional Engineers, Department of Public Safety, Texas Historical Commission, Teacher Retirement System, and the Employees Retirement System. Some agencies also have had one-time inspections conducted in a limited number of their facilities, including the Texas Department of Transportation, Texas Workforce Commission, and the Texas Military Department. In addition to the one-time and recurring inspections, SFMO estimates that at least 3,600 state-owned buildings have never been inspected. This number does not include buildings that may have been acquired by state universities between one inspection visit and the next.

Under SFMO's new inspection procedures, all of the previously mentioned buildings are now on a recurring inspection cycle. This includes rest stops, housing units, and any other state owned or leased facilities previously not inspected.

A 1978 study conducted by the National Fire Protection Association and the Urban Institute recommended that all public buildings be inspected on an annual basis because more frequent fire inspections have been shown to result in lower fire rates. More recent research shows that more frequent inspections yield better results through determining a best-practice inspection frequency (Hall et al. 2008)[10]. To inspect each state-owned building and leased space annually, SFMO would need a nearly threefold increase in the number of inspectors. Fire departments throughout the country face similar challenges, and annual inspections of all facilities within a jurisdiction are rarely achieved.

SFMO's ultimate goal is to inspect all state-owned facilities on a regular basis, consistent with the risk presented by the building. SFMO uses a risk-based approach for establishing a schedule for inspecting all state-owned facilities. SFMO has 14 inspectors and senior inspectors with two vacancies. One of the inspectors is dedicated to the Capitol Complex. SFMO inspectors devote about half of their time to state-owned and state-leased buildings inspections. The remaining time is used for re-inspections and other statutorily required inspections, such as fee based inspections in rural areas and cities where there are no state certified inspectors. SFMO will be able to conduct approximately 288 new building inspections per inspector per year, for a total of 4,032 inspections of state-owned or leased buildings per year.

SFMO has used available information to develop an inspection cycle for the state-owned facilities that represent the greatest risk. SFMO's ability to meet this cycle, however, may be affected by two factors: 1) limitations with SFMO's current database make getting accurate information for planning and calculations difficult and 2) the new inspection process is far more thorough and, therefore, each inspection takes more time to complete than before. SFMO will continue to make the most effective use of its resources possible to try and achieve the following inspection cycle:

- All TDCJ and TJJD facilities will be inspected once every three years. Detention facilities are unique in that the fire and life safety program aims to protect occupants in place rather than to remove them from the building. According to this schedule, SFMO would inspect 1,200 buildings at detention facilities each year. Beginning in FY 2016, SFMO began inspecting residential housing units at detention facilities, Parks and Wildlife, and universities. SFMO is working with TDCJ, TPWD, and universities to give them a list of items that will be looked at during these inspections, such as smoke detectors, electrical services, carbon monoxide detectors (where required) and other life safety items, to ensure that these residential units have adequate life safety protection features.

- Resident and patient contact areas of state supported living centers, state hospitals, and other Texas Health and Human Services Commission facilities that provide residential care will be inspected each year. SFMO estimates that this schedule would require the inspection of approximately 935 buildings each year.

- University dorms will be inspected every other year, at a rate of approximately 507 buildings per year. University dorms are residential occupancies, often with high occupant loads, where occupants are transient in nature and may not be completely familiar with a building and its emergency features and procedures.

- Residential facilities under the charge of Texas Parks and Wildlife will be inspected once every three years, or approximately 164 buildings per year.

- TFC-leased facilities will be inspected once every seven years, once the entire inventory has undergone initial inspections; this is the typical length of a TFC lease for space occupied by state agencies. Under this schedule, SFMO will inspect approximately 114 buildings per year.

After accounting for the critical facilities listed above and other inspection duties, SFMO will be able to conduct annual inspections of approximately 1,112 other state-owned buildings. If we assume, conservatively, that there are approximately 16,000 buildings, this means that these buildings will be inspected once every eight years with SFMO's current staffing. However, SFMO believes a five-year inspection cycle can be achieved with the addition of new inspection software and tablets for inspectors that will reduce the time it takes to document inspection findings.

Findings

The level of compliance varies among the buildings regularly inspected by SFMO. There are, however, some universities that have lagged in achieving and maintaining a code-compliant campus. The University of Texas at Arlington has a number of outstanding issues that have not been addressed. UT-Arlington acknowledges the violations noted in SFMO inspections but has been unable to provide a plan to resolve these issues.

The locking arrangements in some dorms identified in the last report have mostly been corrected, some by just removing the locks.

As Texas universities continue to grow, there is a need for additional student housing. One means to meet this demand is for universities to lease existing apartment complexes and then rent the apartments to students. An example of this arrangement is Texas Woman's

University (TWU) in Denton.

TWU has signed leases with seven different apartment complexes to provide student housing. The complexes house only TWU students, and the students pay rent directly to the university. Several of these apartment buildings do not meet NFPA 1 or NFPA 101 standards for existing apartments. They have the following violations:

- Lack required fire alarm systems.
- Only one means of egress off the second floor, dead-end balconies that exceed the allowed 20 feet (one unit measures 56 feet).
- Lack required emergency lighting.

SFMO instructed TWU to meet NFPA 101 requirements by September 2015; however, the university has argued that SFMO does not have jurisdiction because the buildings are not on state property or owned by the university. The passage of Senate Bill 1105 last session may help resolve this issue.

On April 20, 2016, at approximately 3:48 a.m., a fire caused by a lightning strike was reported at the apartment complex mentioned above. SFMO was notified and conducted a fire investigation.

The occupants near the origin of the fire were alerted by smoke alarms in the housing unit. Occupants on the opposite end of the fire location were only awakened because neighbors pounded on their doors and notified them of the fire. During the investigation it was discovered that some occupants didn't know about the fire or that the smoke that had entered their apartments was because the smoke alarms in their rooms were hard wired smoke alarms and did not have a battery backup as required by code. When the power to the building went down due to the fire, these smoke alarms could not operate. The investigation also found several unsealed penetrations in the fire walls of the complex.

Universities

SFMO continues to work with university systems to make sure fires are correctly and timely reported to SFMO. In FY 2016, the agency received 47 reports of fires at state universities and 42 in FY 2015. SFMO has reinstructed all universities to report any fires

on their campuses that result in the propagation of heat, smoke, and/or flame production. SFMO will determine if the agency is required to investigate. There have been instances where a fire report was received too late to be investigated by SFMO.

It is important for universities to report fires to the SFMO as required to ensure a proper fire scene investigation was conducted so the state has accurate data on fires at state colleges and universities.

SFMO continues to conduct inspections on the university campuses and has found life safety hazard violations that include, but are not limited to, fire alarm systems being red tagged, fire sprinkler systems being red tagged (in some situations for a year or more), and non-working exit signs. In addition, SFMO is not made aware of new construction between inspection cycles. Some of the new buildings are in violation of the fire code. SFMO recommends that universities coordinate with SFMO during the construction process to ensure all new construction complies with life safety codes.

Texas School for the Deaf

The Texas School for the Deaf has resolved most of the 130 fire safety violations noted during FY 2014. Those violations included red and yellow tagged fire alarm and fire protection sprinkler systems, lack of self-closing fire doors, paint spray room lacking a supervised automatic extinguishing system, and other violations.

The Texas School for the Deaf implemented fire watches and has been working cooperatively with SFMO to fix the violations, with a scheduled date of completion for FY 2017.

As of September 2016, the following items have been corrected:

- All sprinkler systems are impairment free.
- Most (75 percent) of fire alarms are now impairment free.
- All extinguishers have been brought up to standard.
- All fire hydrants have been fixed.

There are a few outstanding items to be updated or repaired, but the majority of the major items of concern have been resolved and the school, TFC, SORM and SFMO continue to work together to correct all the life safety hazards that have been identified.

State Hospitals and State Supported Living Centers

SFMO continues to inspect all state hospitals and work with each of them to gain the necessary compliance. SFMO has found 542 violations in the hospitals inspected. These hospitals, like all other buildings, are now being inspected with a more comprehensive fire code. Not all hospitals have been inspected under the newly adopted NFPA 1 Fire Code.

In FY 2016 SFMO received the following reports from state hospitals and state supported living centers:

- Mexia State Supported Living Center (SSLC) - resident ignited papers in dorm bathroom; smoke detected quickly, fire self-extinguished; minimal damage.
- Mexia SSLC - laundry cart found burning, another found already burned outside housing unit; staff extinguished quickly; no other damage.
- Big Spring State Hospital - cardboard under pallets of water bottles on truck parked in sun ignited after the bottles acted as prisms.
- Austin SSLC - vehicle crashed into shed on property and caught fire; minor damage to shed roof; vehicle occupants taken to hospital; no residents or staff in danger; no other building damage.
- Denton SSLC - grass fire at gate entrance caused by cigarette was extinguished by employee; no structures damaged.
- Mexia SSLC - resident removed his shirt and set it on fire; staff member stomped it out; no property damage.
- San Antonio SSLC - fire at duplex receptacle with power cord for motorized bed in patient room, full evacuation.

- Mexia SSLC - overhead power line may have arced, igniting grass below; small area burned between two buildings; no other damage.

- San Antonio State Hospital - electrical transfer box ignited small grass fire at parking lot; extinguished by employee.

- San Antonio State Hospital - patient set fire to curtains; extinguished by employee.

Some of the fires at the facilities are being started by residents and patients with access to cigarettes and/or flame producing devices, such as lighters. As stated in last year's report, it would be beneficial if the patients/residents did not have direct access to these products.

SFMO found a total of 507 violations at state supported living centers.

SFMO posted all reported state properties fires at www.tdi.texas.gov/fire/fmfsifirereport.html.

Corrections and Detentions

The primary issue identified at Texas Department of Criminal Justice facilities is a lack of required fire alarm systems. Inspections have found that 233 out of 400 facilities lack an operational fire alarm system. In many cases, TDCJ has issued a work order for repairs or new systems; however, there has been no further action. Many of these work orders are more than 10 years old. SFMO has been working aggressively to address this longstanding issue and has made changes to policies and the administration of inspections of detention facilities.

SFMO continues to meet with TDCJ representatives and address issues within the TDCJ system, such as closing out work orders even when the work has not been completed. SFMO has offered to assist TDCJ identify buildings that need operating fire alarm systems. With continued cooperation of TDCJ Risk Management and Safety personnel, SFMO will be able to identify issues, take corrective action where necessary, and make the best use of TDCJ resources.

TDCJ is reporting when any system goes down and implementing a fire watch, based on the criteria set up by SFMO to ensure that the inmates are properly protected and can be removed from the facility in case of fire. In addition, TDCJ has put in place new procedures to ensure that fires at their facilities are being correctly reported to SFMO.

Appendix A: Fire and Life Safety Risk Assessment Spreadsheet for State of Texas Facilities

A building's relative risk value takes into account a number of factors: building use; occupant load; building height; fire protective systems and features; and findings from previous SFMO inspections. SFMO's risk ranking system assigns various weights to these factors to determine the relative risk value for the building. Facilities with a higher relative risk would be inspected more frequently than those with a low relative risk. SFMO also provides information from the risk ranking system to SORM, to keep them up to date on which facilities need the most attention with regard to fire and life safety concerns.

The Fire and Life Safety Risk Assessment methodology consists of a number of factors, determined by general building characteristics and inspections that contribute to an overall risk for facilities in the State of Texas. The facility's overall risk is a product of all the factors. All facilities are based off a starting risk value of "1."

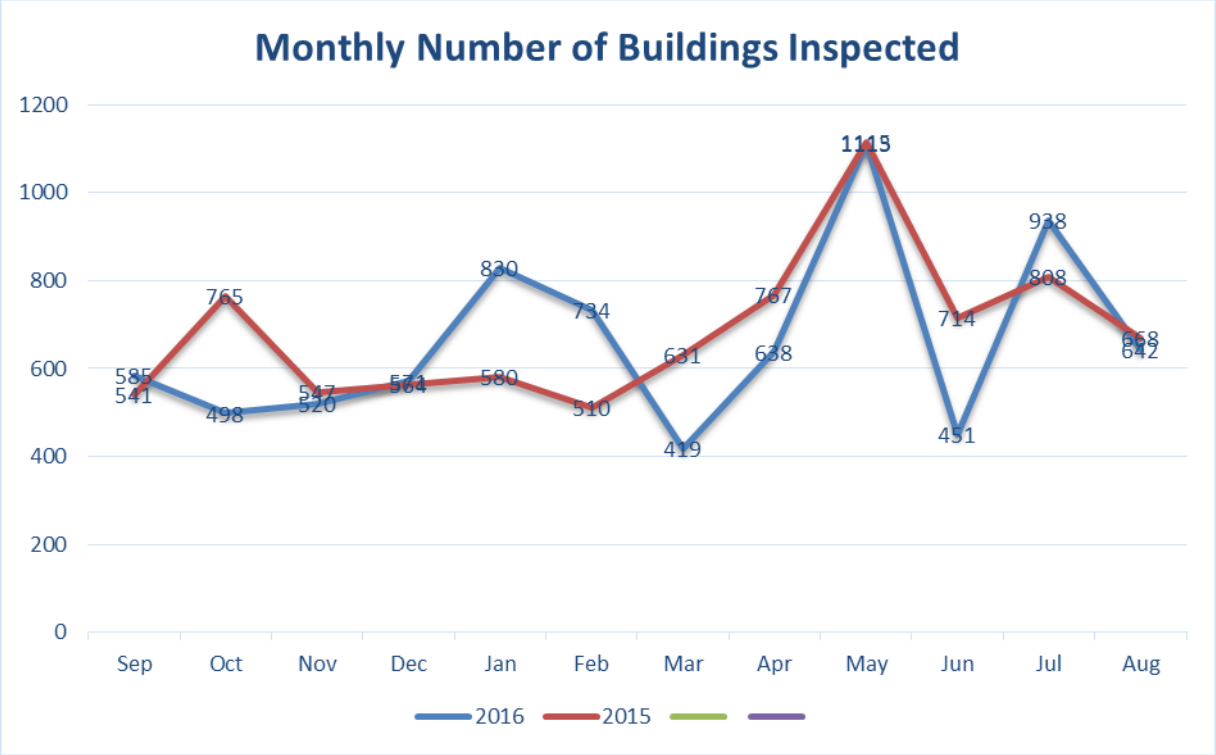
For any factors in which a specific value is not applicable or has not yet been determined, a place holder of "1" is assigned.

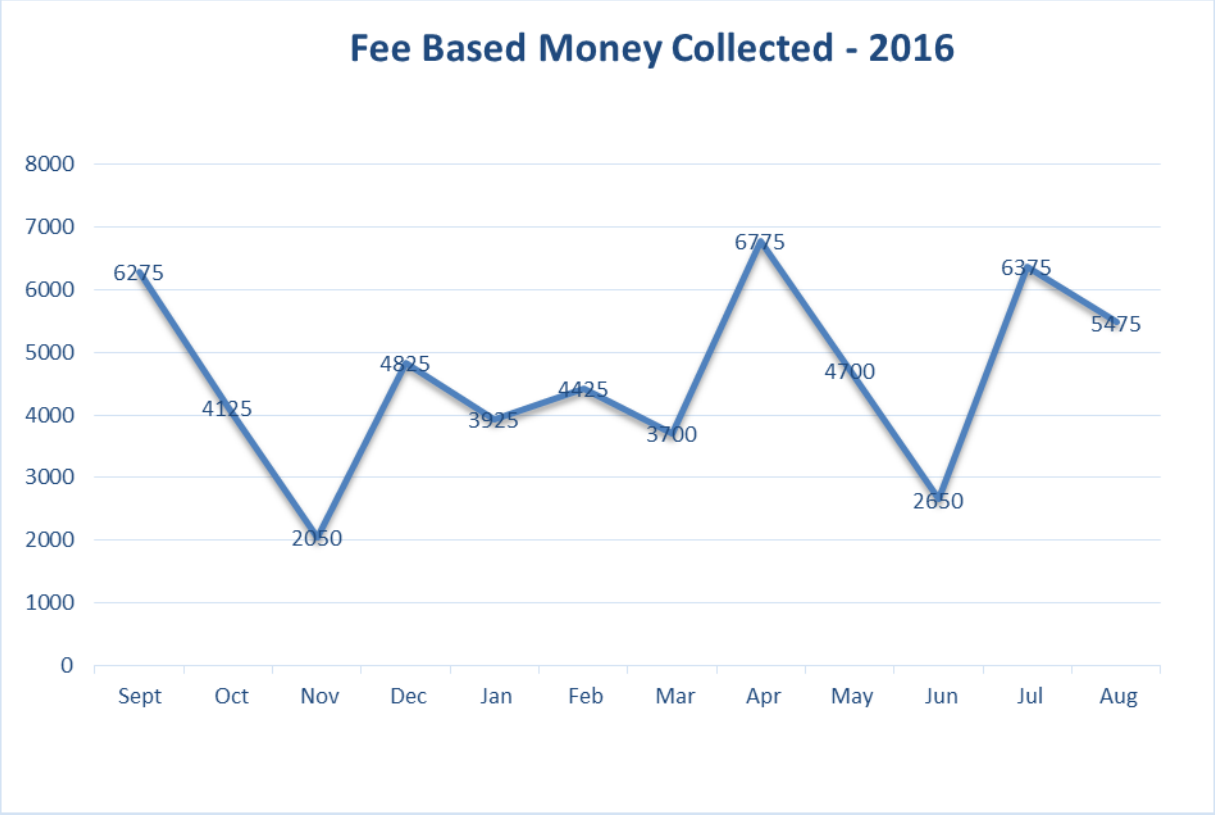
Three factors -- Valuation, Critical Facility and Facility Management -- have been identified but are not yet included in the overall risk calculation.

The Overall Risk Factor is the product of all the factors listed below. A higher value of the Overall Risk Factor is equivalent to a greater risk.

- Building Height Factor
- Building Use Factor
- Occupant Load Factor
- Sprinkler Protection Factor
- Alarm Factor
- Other Systems Protection Factor
- Sprinkler Violation Factor
- Alarm Violation Factor
- Other Systems Factor
- Egress Violation Factor
- Building Services Violation Factor

Appendix B: Inspection Measures





Appendix C: Use and Meaning of "Red Tag" and "Yellow Tag"

In this report, reference is made to "red tag" and "yellow tag." The yellow tag is a visual indication that the fire alarm, fire sprinkler, or fire extinguisher has a deficiency that could result in underperformance of the system in the event of a fire. Such conditions include, but are not limited to: pipe sizes too small, inappropriate head spacing, annual performance testing failure, etc. On the other hand, a red tag indicates a deficiency from which the tagged system cannot operate as designed or might possibly fail to operate at all. Yellow tagged systems may continue to operate but should be repaired within a reasonable period of time, generally 14 days. A system that is red tagged generally requires immediate repair or may require the building to have alternate protection means, such as a fire watch.

References

[1]*Annual Report Regarding Findings in Conducting Inspections*, Texas Department of Insurance, Texas State Fire Marshal's Office, Austin, Texas, December 2012

[2]Hall, et al., *Measuring Code Compliance Effectiveness for Fire-Related Portions of Codes, Final Report*, National Fire Protection Association & Fire Protection Research Foundation, 2008

[3]Data used for this comparison was Fiscal Year 2013; the previous year's report contained figures for Calendar Year 2013.

[4]Data compiled by Roger Young, Program Specialist, Texas Department of Insurance, State Fire Marshal's Office

[5]State Real Property Inventory., ID 304., Legislative Budget Board., April 2013

[6]Campbell, R., *U.S. Structure Fires in Office Properties*, National Fire Protection Association, 2013

[7]Ibid

[8]*Nonresidential Building Fires (2009–2011)*, Topical Fire Report Series, Vol. 14, Issue 5, National Fire Data Center, Department of Homeland Security, Emmitsburg, MD, June 2013

[9]Texas Facilities Commission, Legislative Appropriations Request for Fiscal Years 2016-2017, http://www.tfc.state.tx.us/divisions/commissionadmin/lar/LAR2016-17_8-%2018.pdf

[10]Hall, et. al.