



# ANNUAL REPORT REGARDING FINDINGS IN CONDUCTING LIFE SAFETY INSPECTIONS

FY 2014



TEXAS DEPARTMENT OF INSURANCE

Published February 2015

**Texas Department of Insurance**

**David Mattax**, Commissioner of Insurance

**Chris Connealy**, State Fire Marshal

**State Fire Marshal's Office**

333 Guadalupe Street

Austin, Texas 78701

**(512) 676-6800**

**[www.tdi.texas.gov/fire](http://www.tdi.texas.gov/fire)**

# Highlights

- The Inspection Division increased the number of buildings inspected by 34.9%.
- The state legislatively mandated inspections of facilities controlled and leased by Texas Facilities Commission (TFC) only cover approximately 3% of the total square footage of state occupied building space.
- The State Fire Marshal's Office (SFMO) has identified trends in the university systems, including the use of privately owned residential facilities that have not received the level of inspection scrutiny exercised in state-owned facilities, and the use of locking arrangements in shared bathrooms that could demonstrably place students in peril.
- Lack of funding continues to be the primary response by inspected entities as to why deficiencies cannot be resolved.
- Complete data on the number, type, and location of all state-owned properties continues to challenge SFMO as new facilities are acquired or constructed.
- Life safety inspections continue to find persistent violations of safe practices in the use of extension cords and power strips.
- Out of 400 detention units under the Texas Department of Criminal Justice (TDCJ), 233 do not have a working fire alarm; consequently, these units have a constant fire watch when automated fire alarms are not present or operational.
- While most state schools and assisted living centers do an excellent job of maintaining life safety code compliance, the Texas School for the Deaf, for example, has numerous violations, only some of which were addressed in 2014, and they continue to operate with impaired fire alarm and fire sprinkler systems; the San Angelo State Supported Living Center has had numerous, purposely started fires.

- Although SFMO has increased the number of inspections of state-owned and state-leased property by 34.9%, the frequency of these inspections do not meet best practices. SFMO recommends a best practice of no longer than five years between building inspections. This would require additional inspectors.

# Background

Texas Government Code, Section 417.0081(c), requires the State Fire Marshal's Office to submit an annual report to the Governor, Lieutenant Governor, Speaker of the House of Representatives, and appropriate standing committees of the legislature, regarding the State Fire Marshal's findings in conducting inspections. 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 that are not under the control of TFC. 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 2014 marks the second full year that SFMO has conducted legislatively mandated inspections in buildings leased by the state. 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, SFMO conducted inspections, for a fee as authorized by statute, of certain non-state-owned facilities as authorized by Government Code, Chapter 417.008 (f).

SFMO began using the 2012 edition of National Fire Protection Association (NFPA) Life Safety Code® (NFPA 101) on November 8, 2012. The State Fire Marshal uses other NFPA codes and standards for guidance in assessing and directing remediation of fire and life safety hazards. This code action is taken under the authority of the Texas Government Code, § 417.008 and § 417.0081, and the Texas Administrative Code, 28 TAC § 34.301 ff.

## Top 10 Life Safety Code Violations in State Buildings

1. Lack of annual inspections of fire alarm and fire sprinkler systems, and systems that have either been red or yellow tagged for years.
2. Key card operated locks in conjunction with panic hardware.
3. Inoperative exit signs and emergency lighting units, or no exit signs and emergency lighting.
4. The use of swipe cards to exit a building and no motion sensor or button.
5. The use of extension cords and the improper use of power strips.
6. Stairwell doors missing latching hardware or equipped with panic device hardware when fire exit hardware is required.
7. Fire doors not properly closing and latching.
8. UL labels either painted over or missing all together on fire doors.
9. Portable fire extinguishers not being properly serviced.
10. The lack of GFCIs on vending machines, water fountains, and within 6 feet of sinks within countertops.

### 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 might 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.

# Executive Summary

In order 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 who are not complying with life safety standards.

SFMO continues to work 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 spaces leased by TFC have continued to be successful in identifying and resolving life safety risks. This success is 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 Life Safety Code. 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 specific difference between obtaining compliance to the Life Safety Code in state-owned buildings versus its application in TFC-leased buildings. SFMO has clearly defined enforcement authority, embodied in statute, in state-owned buildings. On the other hand, 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, to ensure that state buildings are a safe environment for state employees and the public. Many building owners have been willing to make necessary changes once they are made aware of the risks to not only the state agency tenants but other tenants as well.

Historically, SFMO has inspected slightly less than 75% of the total state building inventory under the charge and control of TFC, or leased for the use of a state agency by TFC. In the FY 2012 report, SFMO stated that it was planned to begin regular inspections of all such state-owned or leased buildings. In FY 2013, SFMO inspected 20.7% more

buildings than the previous year. During the 2014 fiscal year, SFMO inspected 34.9% more buildings. The State Fire Marshal's Office also added additional personnel during FY 2014. These additional personnel were placed in training programs and paired with veteran personnel during the year. While they contributed, to a degree, to the increased coverage of state buildings, they will make a more significant contribution to meeting the inspection goals of the state during the complete 2015 fiscal year.

As first described in the *2012 Annual Report Regarding Findings in Conducting Inspections*<sup>i</sup>, SFMO has determined that 14 years is an excessive length of time for any building to go without an inspection. More frequent inspections have been shown to reduce fires<sup>ii</sup>. SFMO's goal is to inspect all facilities on a cycle of no less than once every five years. Over the course of FY 2014, SFMO added two additional life safety inspectors and filled existing vacancies. With the addition of these inspectors, SFMO reasonably expects that the inspection cycle will be reduced to eight years for facilities identified as critical (e.g., dormitories, detention facilities, HHS facilities, etc.) To achieve a five-year inspection cycle would require SFMO to hire two additional inspectors.

SFMO conducted over 1,984 inspections encompassing 7,370 individual structures in FY 2014. This compares with 5,471<sup>iii</sup> individual structures inspected in FY 2013. The State Fire Marshal's Office has identified at least 2,434 specific locations<sup>iv</sup> owned or occupied by State of Texas agencies. However, a location may have more than one separate structure to be inspected. We estimate that there may be as many as 19,000 individual state-owned or state-occupied structures. Since there is no comprehensive database of state-owned properties, SFMO continues to collect information during each inspection to update our list of individual buildings.

SFMO continues to study upgrade options for its inspections database that would enable SFMO to track detailed inspection finding information and compliance rates. An updated inspections database would more readily provide detailed information, which will make the execution of SFMO's risk analysis and ranking systems more efficient and accurate<sup>v</sup>. Information on the number and types of state-owned and state-leased buildings to date 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 currently available on these facilities is sparse and often outdated. SFMO



therefore can only collect detailed information useful for a risk analysis after inspecting the site.

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.

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 TFC and SORM, to keep them up to date on which facilities need the most attention with regard to fire and life safety concerns.

During FY 2014, SFMO worked with SORM, TFC, and the General Land Office (GLO) to improve the quality of building data available to perform the risk analysis. Although the risk analysis has improved, the process is still limited by lack of data, including a method for providing notice to SFMO when a new building is anticipated for construction or is acquired.

SFMO coordinates with TFC building management when scheduling inspections, in order to ensure access to all building areas and necessary equipment. After the inspection is completed, SFMO provides inspection reports to TFC and SORM. SFMO may also directly provide a copy to the heads of agencies occupying the buildings. At that point it is TFC’s responsibility to generate work orders to correct any findings -- coordinating with occupants as necessary -- or to request additional funding for repairs that may not be possible within their current budget.

## Findings

The following buildings, among others, have been identified as having a high potential risk based on SFMO's risk ranking system.

<b>Current Risk Rank</b>	<b>Previous Risk Rank</b>	<b>Facility Name</b>
1	1	Lyndon B. Johnson Building
2	2	William B. Travis Building
3	3	Department of State Health Services, Tower Building
4	4	William P. Hobby Building
5	5	Price Daniel Sr. Building
6	6	Steven F. Austin Building
7	7	John H. Winters Building
8	8	Robert D. Moreton Building
9	9	Brown-Heatly Building
10	10	William P. Clements Building

These buildings have several common features and deficiencies that contribute to their elevated level of risk. All of 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 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 do other state buildings. For instance, while some areas of the Lyndon B. Johnson Building are currently under renovation, including the addition of fire sprinkler coverage on the fourth floor, additional problems were identified during a recent life safety inspection, including a critical issue with the dry fire sprinkler system for the penthouse. The Department of State Health Services' Tower Building is the only high-rise building in the group of TFC-managed facilities that lacks any fire sprinkler system coverage. Sprinkler systems are a crucial part of the overall fire protection scheme in high-rise structures. There are also a number of deficiencies with regard to the building's egress facilities, including excessive dead-end corridors and unsealed

penetrations. SFMO understands that correction of many of these issues depends on funding and may be in varying stages of corrective action based on availability of appropriated funds.

The most prominent issues throughout state-owned buildings include the potentially unsafe use of space by building tenants. Improper use of extension cords, power strips, and food warming and cooking equipment are the most common findings. 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 <sup>vi</sup>.

Cooking equipment is a leading cause of fires in the workplace, accounting for 28.9% of fires identified as to cause in office buildings<sup>vii</sup>. 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 a large amount of 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 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 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. Were each occupant to have his or her own microwave, toaster, coffee pot, heater, or refrigerator, the design loads for the office would be exceeded and could very well cause stress on the building's electrical system over time.

Inspectors have also found 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 simply cannot tell the difference between "good" resistance and "bad" resistance heating.

Obtaining compliance in this area continues to be a challenge because of a deficiency of education on these issues, turnover in agencies and agency personnel, and the frequent reconfiguration of office spaces. SFMO, TFC, and SORM have been working together over the past year to develop programs to address these tenant issues. SORM has produced a video on workplace fire safety that is available for safety officers from state agencies to distribute to their staff. Often, employees are not aware of the hazards associated with misusing the electrical facilities in their workspaces. Hopefully, this video will prompt employees to evaluate their individual work areas and make changes where necessary. TFC has also recently updated its tenant manual to add further clarification on 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 directly issue notices to the leadership of tenant agencies, informing them

of life safety code violation issues. TFC will copy SFMO and SORM on these notices, so that SFMO can follow up directly with agency leadership, with the hope of achieving greater compliance.

Timely correction of code violations in TFC-owned and managed buildings has historically been a challenge. SFMO seeks to obtain compliance with resolution of identified deficiencies through communication with the stakeholders in the affected agency. SFMO's primary mechanism for enforcing the code is to notify TFC and request a response, typically within 14 days.

While the SFMO can use the mechanism provided for through Government Code §417.008 to issue an order requiring anything from remediation up to and including removal of a building that presents a dangerous condition, the SFMO generally does not directly enforce an order requiring remedial action in a state-owned building. Enforcement of a Fire Marshal's Order issued in accordance with §417.008 may require assistance from the Office of the Attorney General to secure an injunction. This process is not only extremely time consuming and costly, but is also impractical for correcting the majority of noncompliant conditions found in the course of a typical inspection. If a dangerous condition is identified and the affected agency will not make a credible effort to correct the deficiency, the Fire Marshal has the authority to enforce correction of the condition under Texas Government Code, Section 417.008, though this action in state-owned property has not been necessary, to date. Additionally, TFC and occupying agencies are often limited in terms of available funds for corrections whose cost has grown due to continued abeyance, and in some cases, there has been confusion as to which agency is responsible for correcting certain problems (TFC or the tenant agency). As a result, numerous inspection findings have remained uncorrected for many years.

A good example of this is the William P. Hobby Building in Austin. Admittedly, TFC is working through a list of approximately 100 violations, but the fire alarm and fire sprinkler systems remain tagged, including both yellow and red tags. Some tags date back seven years or more.

# 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 currently 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 the 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 is continuing to collect further 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, the SFMO inspectors will 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, to date. 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.

The mandatory inspection of TFC-leased facilities has resulted in an increased workload. Over 10 million square feet of building space has been added to SFMO's list of regularly conducted inspections. SFMO inspectors schedule these new inspection duties around existing responsibilities and other annual or ongoing inspections.

Many buildings that are 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 also 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.

Section 417 of the Texas Government Code directs SFMO to prioritize inspections of TFC-leased facilities using a risk based methodology. Fire risk assessments, including the fire risk ranking method SFMO plans to use for prioritizing inspections of leased facilities, require detailed data and information in order to be effective. The current information available from TFC on the leased building inventory is very 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 currently 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.

## **Findings**

SFMO inspectors have found that routine maintenance of life safety features and equipment has been lacking in the majority of leased facilities, despite the fact that many of these buildings are subject to inspection by local jurisdictions. Often the local authority lacks staff to conduct the necessary 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.) has also been 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 prior to the executive summary.

When noncompliant conditions are found during inspections, TFC provides a written notification to building owners that they may be in violation of the terms of their lease



agreement unless the items noted in SFMO's report are satisfactorily addressed. Additionally, SFMO inspectors provide a copy of their findings to the local authority.

In the event that an owner does not provide a timely response or chooses not to 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. The vast majority of owners have been cooperative and 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.

Previous years' reports contained references to state agencies moving because the local building owner failed to correct deficiencies. The SFMO inspectors continue to have limited success in obtaining progress reports and timelines from lessor building owners on corrective measures required to correct the noted deficiencies.

The enforcement of the Life Safety Code has been extremely successful. Despite the limited tools available to the SFMO for enforcement, the private building owners have numerous additional incentives to correct noncompliant findings that are not present for TFC-owned and managed facilities. Private building owners must often answer to local code officials who have a significant number of tools available to gain compliance, ranging from fines to the direct authority to condemn an unsafe building. Building owners also face a financial incentive in the form of their lease agreement. If building owners do not provide a code-compliant facility, TFC may terminate the lease and the building owners would lose an important customer.

It is significant that although TFC has contract language for its leased facilities which allows it to vacate facilities that refuse to correct life safety deficiencies, similar language does not exist in most property lease agreements of other state entities.

## State-Owned Buildings Not Under the Control of TFC

Buildings under the control of TFC represent only a small portion of state-owned buildings. TFC maintains 64 buildings and 18 parking garages, totaling 10,868,307 square feet. 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 in excess of 303 million square feet. During previous inspections of state buildings, it is often found that a single address listed for an agency might encompass many individual buildings.

### Current Inspection Schedule

SFMO prioritizes inspections based on life safety risk analysis. Buildings at a higher risk receive more frequent inspections.

### Recurrent Inspections

Buildings with the highest risk analysis include state universities, state supported living centers, and state hospitals, Texas Department of Criminal Justice (TDCJ), Texas Juvenile Justice Department (TJJD), and certain state preservation board facilities including the Capitol. The number of buildings inspected on a recurring basis is just over 11,000 individual buildings.

SFMO has used the available information to schedule the inspection of the following state-owned facilities that represent the greatest risk:

- Patient contact areas of state supported living centers, state hospital facilities, and other Texas Health and Human Services Commission facilities that serve patients will be inspected each year. These facilities provide long-term care for patients who may not be capable of self-preservation and may also need to be protected in place. 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.
- 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.
- 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.

### **Other Agency Inspections**

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 have also 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 Forces.

In addition to the one-time and recurring inspections, SFMO estimates between 3,600 and 6,600 state-owned buildings have never been inspected. This number does not include buildings that may have been acquired by, for instance, state universities between one inspection visit and the next. Acquisition often occurs without any information being passed on to the SFMO, and the building or buildings are discovered on a subsequent inspection.

### **Recommended Inspection Schedule**

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, since

more frequent fire inspections have been shown to result in lower fire rates. This is merely a recommendation; while research shows that more frequent inspections yield better results, a best-practice inspection frequency has not been established (Hall et al. 2008<sup>viii</sup>). If SFMO were to inspect each state-owned building and space leased by TFC, the number of inspectors would need to be increased nearly threefold. 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. In lieu of inspecting all facilities annually, SFMO uses a risk-based approach for establishing a schedule for inspecting all state-owned facilities. SFMO now has 14 field inspectors, an inspector dedicated to the Capitol complex, and a Chief Inspector. Inspection personnel can each inspect 576 buildings per year (average of 48 buildings per month). However, SFMO inspectors must devote only about 50 percent of their available time to state-owned and state-leased buildings inspections. The remaining time is used for re-inspections and other statutorily required inspections, meaning that 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.

As previously noted in this report, studies show that more frequent inspections reduce the number of fires. Fire safety inspections not only assess the safety of the building and its components, they also promote prevention efforts by providing an opportunity to educate building occupants and management on how they can contribute to a safer environment. A five-year schedule allows SFMO to stay up to date with any building renovations and will keep occupants familiar with SFMO inspectors and life safety guidelines. A five-year inspection cycle may be achieved with 15 inspectors. SFMO currently employs 14 inspectors. At this level, the inspection period is estimated to be 6.8 to 8.2 years.

### **Findings: State Universities**

Of the buildings regularly inspected by SFMO, the level of compliance varies. State-run universities generally do an excellent job of maintaining their facilities, from a fire and life safety standpoint. Many universities have embraced the importance of fire protection and have hired their own fire protection professionals or “university fire marshals,” who

actively enforce the Life Safety Code on campus. There are, however, some universities that have lagged behind in achieving maintaining a code-compliant campus. The University of Texas at Arlington (UTA) has a number of outstanding issues that have not been addressed, several dating back to inspections conducted in 2006. While UTA acknowledges the Life Safety Code violations noted in SFMO inspections, they continue to be unable to provide any plan to resolve all the issues. SFMO has also noted issues related to routine maintenance of building fire protective features at Sul Ross State University and at the University of Texas at Tyler. A recent re-inspection at the University of North Texas revealed that inspection deficiencies that had been reported as corrected had in fact not been done. Furthermore, new deficiencies were found.

A recent trend in university housing to construct adjacent dormitory rooms that share a common bathroom but provide locking arrangements that would allow an occupant of the bathroom to be locked in the bathroom revealed an issue. The locking arrangement is intended to provide security to the dorm room occupant but creates a risk of entrapment and inability to freely egress the bathroom in an emergency. This locking arrangement has apparently been implemented at times without the consent of the university. SFMO has requested the universities to provide additional information on the number of dorm rooms and bathrooms affected.

Also, 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)-Denton.

TWU has signed leases with seven different apartment complexes to provide student housing. The university has taken over the apartment complexes for its students only and the students pay rent directly to the university. Several of these apartment buildings do not meet 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 legal counsel advised the university not to comply with the SFMO directive. The university stated that SFMO is not the AHJ since the buildings are not on state property and the buildings are not owned by the university.

This problem is not likely to be unique to TWU as other universities look to expand residence capacity without constructing new facilities. If these privately owned facilities are allowed to ignore the inspections of the SFMO, a double standard for safety will exist for students depending on whether they live in state-owned buildings or in buildings for which they have paid room payments to the school, buildings that have the signage of the school on them but are not owned by the state.

Inspections of the facilities in Denton were initiated by the SFMO because the city had never conducted inspections of any of these apartments prior to the SFMO calling them and requesting to conduct a joint inspection.

### **Findings: State Schools and Hospitals**

The state schools and hospitals have also generally done an excellent job in maintaining code-compliant campuses. These facilities care for individuals with special needs who may not always be able to care for themselves in the event of an emergency.

However, two specific facilities have severe life safety concerns. These facilities are:

#### **Texas School for the Deaf**

- 130 fire safety violations were noted, including but not limited to the following: of those 130 violations, only 50 were corrected during FY 2014, with an additional 2 violations noted.
- The sprinkler systems have yellow impairment tags throughout the campus, indicating the systems are not in compliance with applicable NFPA codes.
- The fire alarm systems have yellow and/or red tagged impairment stickers

present throughout the campus, indicating the systems are not in compliance with applicable NFPA codes.

- Escutcheon plates for the sprinkler heads are missing, damaged, or not flush with the ceiling throughout the campus.
- Vending machines and drinking fountains throughout the campus are not protected by ground-fault circuit interrupters (GFCIs).
- Numerous sprinkler heads in mechanical rooms throughout the campus are not code compliant due to the placement of the heads several inches to several feet below the ceiling. Recommendations were to employ a licensed sprinkler contractor to perform a survey of the mechanical room sprinkler heads to confirm they are code compliant.

### **San Angelo State Supported Living Center-San Angelo, Texas**

- Numerous small fires purposefully started by clients using smoking materials (cigarettes, cigarette lighters, etc.).

### **Findings: Correctional and Detention Facilities**

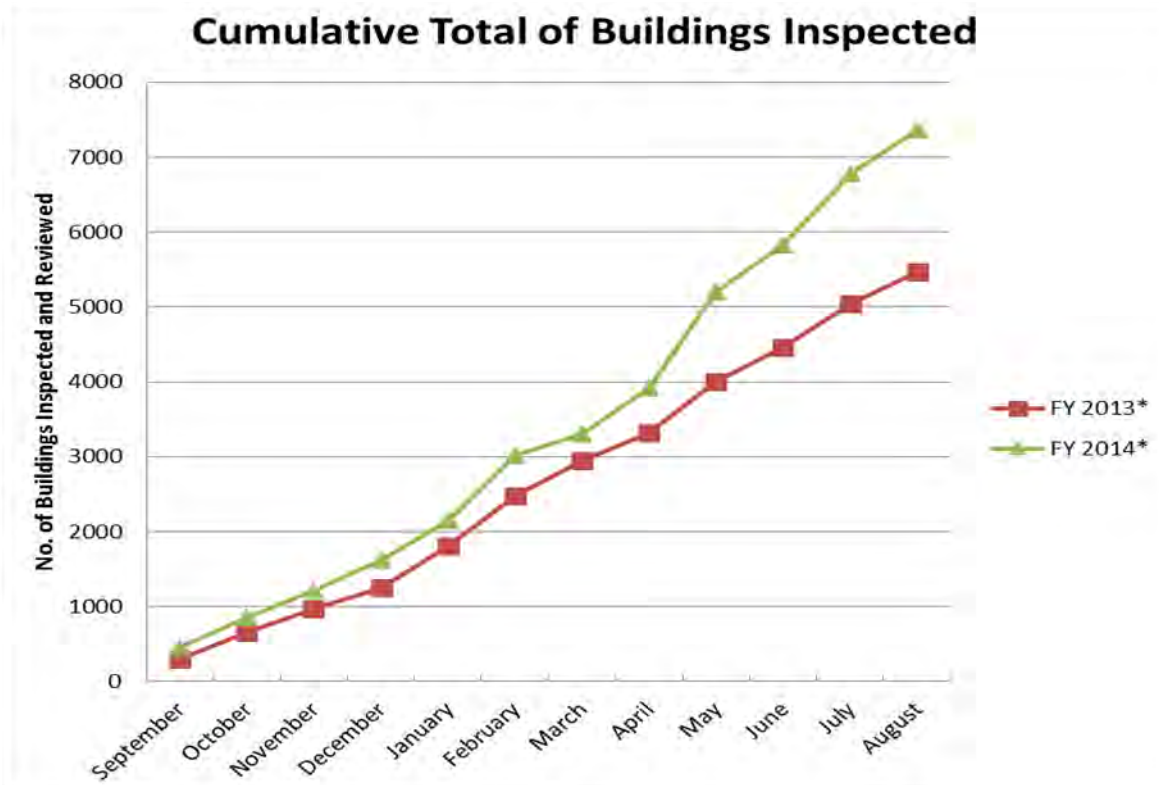
Out of 400 detention units under the Texas Department of Criminal Justice (TDCJ), 233 do not have a working fire alarm; consequently, these units have a constant fire watch when automated fire alarms are not present or operational.

SFMO and TDCJ continue to work together to remedy these deficiencies.

# Summary

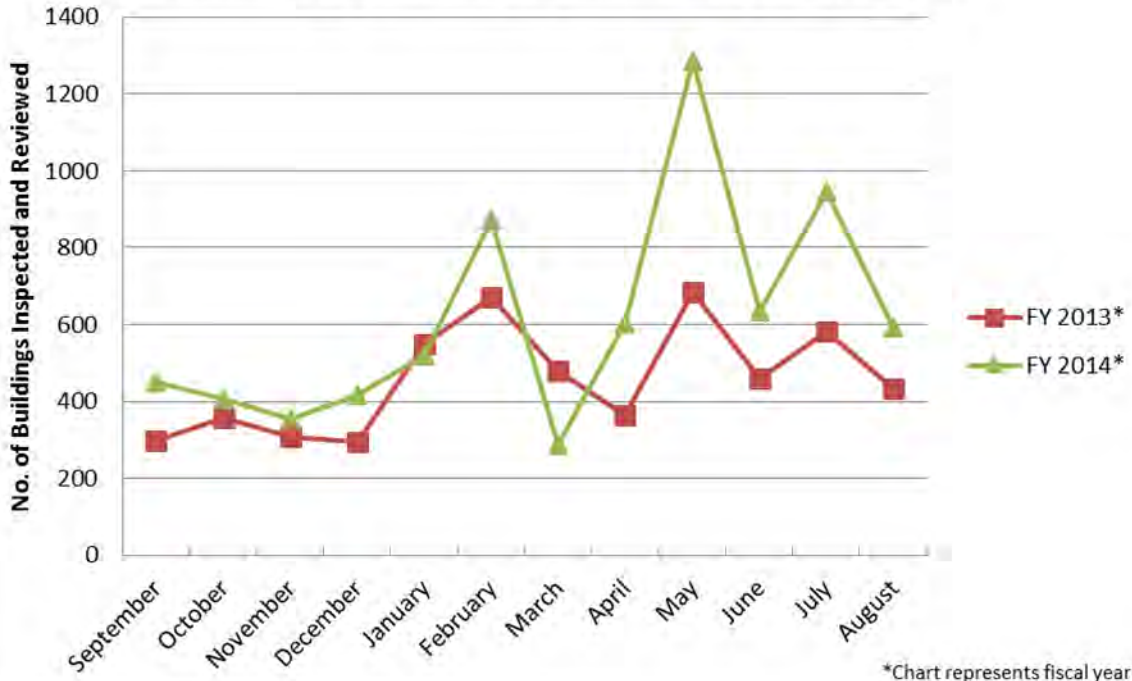
SFMO continues to provide life safety inspection services based on nationally recognized standards and best practices in order to assure the safety of the citizens of Texas. These services are provided by a limited number of personnel, such that it is not possible to inspect all state-owned and state-leased buildings on a frequency of inspections that is consistent with best practices and data-supported risk improvement. Additional personnel would demonstrably improve the frequency with which state-occupied space is inspected. Nonetheless, SFMO inspectors have improved their productivity in inspections by 34.9%.

There continues to be a significant number of life safety violations noted during SFMO inspections. SFMO is prepared to assist the various agencies in achieving successful resolution of the many deficiencies identified by the inspection process.





# Monthly Number of Buildings Inspected



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

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

## References

<sup>i</sup>*Annual Report Regarding Findings in Conducting Inspections*, Texas Department of Insurance, Texas State Fire Marshal's Office, Austin, Texas, December 2012

<sup>ii</sup>Hall, et al., *Measuring Code Compliance Effectiveness for Fire-Related Portions of Codes, Final Report*, National Fire Protection Association & Fire Protection Research Foundation, 2008

<sup>iii</sup>Data used for this comparison was Fiscal Year 2013; the previous year's report contained figures for Calendar Year 2013.

<sup>iv</sup>Data compiled by Roger Young, Program Specialist, Texas Department of Insurance, State Fire Marshal's Office

<sup>v</sup>Campbell, R., *U.S. Structure Fires in Office Properties*, National Fire Protection Association, 2013

<sup>vi</sup>Ibid

<sup>vii</sup>*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

<sup>viii</sup>Hall, et al.