



REPORT OF
THE
STATE AUDITOR

Public Safety Programs
Division of Oil and Public Safety

Performance Audit
May 2007

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This report contains the results of a performance audit of the Division of Oil and Public Safety's Public Safety Programs. The audit was conducted pursuant to Section 2-3-103, C.R.S., which authorizes the State Auditor to conduct audits of all departments, institutions, and agencies of state government. The report presents our findings, conclusions, and recommendations, and the responses of the Division of Oil and Public Safety.

TABLE OF CONTENTS

	PAGE
Report Summary	1
Recommendation Locator	5
Description	9
FINDINGS AND RECOMMENDATIONS	
Chapter 1: Public School Construction	15
Application of Building Code	17
Building Plan Documentation	22
Approved Building Plans	25
Building Permits	27
Required Inspections	30
Code Violations	34
Completeness of Inspections	36
Documentation	40
Resources	43
Fees	46
Chapter 2: Other Public Safety Functions	49
Carnivals and Amusement Parks	49
Registration	49
Permitting	53
Daily Inspections	57
Inspector Qualifications	59
Oversight	62
Explosives	65
Boilers	73
Inspections	73
Violations	77
Chapter 3: Administration	81
Cash Collections	82
System Access	86



**Public Safety Programs
Division of Oil and Public Safety
Performance Audit, May 2007**

Authority, Purpose, and Scope

This performance audit was conducted under the authority of Section 2-3-103, C.R.S., which authorizes the Office of the State Auditor to conduct performance audits of all departments, institutions, and agencies of state government. The audit work was conducted from February 2006 to March 2007 in accordance with generally accepted government auditing standards. During the audit we evaluated the Division of Oil and Public Safety's oversight of four of its public safety programs – public school construction, carnivals and amusement parks, explosives, and boilers, including the Division's permitting, registration, inspection, and enforcement responsibilities. We also contracted with Colorado Inspection Agency, a private company that conducts building plan reviews and inspections, to evaluate the Division's Public School Construction Program. An audit of the Division's Petroleum Storage Tank Program was issued by the Office of the State Auditor and released by the Legislative Audit Committee in October 2006. We acknowledge the assistance and cooperation of the Division of Oil and Public Safety.

Background

The Division of Oil and Public Safety (Division) is located within the Department of Labor and Employment. In accordance with the statute (Section 8-20-101, C.R.S.), the Division regulates a variety of public health and safety functions, including enforcing rules, regulations and statutes governing public school construction, carnival and amusement park rides, explosives, and boilers. Through its Public School Construction Program, the Division oversees the construction of public school projects for K-12 and junior colleges statewide, which includes adopting building code standards for public schools, reviewing and approving building construction plans, issuing building permits, inspecting schools throughout the construction phase to ensure the schools have been designed and built in compliance with building codes, and issuing certificates allowing the schools to be occupied. Through its Carnival and Amusement Park Program, the Division oversees the operation of mechanical rides, which includes establishing standards for the construction, repair, and maintenance of carnivals and amusement parks and an annual registration process. Through its Explosives Program, the Division oversees individuals and businesses that manufacture, sell, purchase, store, transport, or use explosives. Through its Boiler Program the Division establishes standards for the safe construction, installation, operation, maintenance, and repair of boilers and conducts boiler inspections.

The Division's public safety programs are entirely cash-funded by fees charged for regulated activities. Each program assesses a different fee for the Division's services. Fees range from \$20 to \$10,000 depending on the activity. In Fiscal Year 2006 the Division's total revenue across all of its activities was about \$42 million and total expenditures were about \$36.8 million.

For further information on this report, contact the Office of the State Auditor at 303.869.2800.

Summary of Audit Findings

Public School Construction

We reviewed the Division's practices related to reviewing and approving building plans, issuing permits, and conducting inspections for all public school and junior college construction projects statewide and identified significant concerns about the value of the Public School Construction Program and the Division's ability to ensure the safety of the children and adults who occupy these schools:

- **Building Plan Reviews.** Our contractor reviewed the building plans for a sample of 10 projects that had been approved by the Division and identified at least 70 code issues for all 10 projects that were not identified by the Division during its plan review. Code issues not identified included building plans without required sprinkler systems, fire walls, or the appropriate number of exits. Furthermore, for the 10 projects reviewed, our contractor found the building plans for three projects did not include a list of the special inspections that were required for the projects; the plans for four projects did not include the required energy efficiency schedules; and the plans for three projects did not provide complete information related to the mechanical systems. At the time of our review, some of these buildings were completed and occupied by students and staff, while others were still under construction.
- **Approved Building Plans.** Our contractor observed the Division's procedures for on-site inspections with respect to approved building plans and found that (1) neither the Division's inspector nor the school district contractor knew if the building plans at the work site were the final version of plans the Division had ultimately approved; (2) the Division's inspector did not bring the Division's set of approved plans to the project work site, nor did the inspector consistently ask to review the plans that were on-site or refer to the plans during the inspection; and (3) two of the seven schools inspected did not have any building plans at the work site at the time of the inspection. Currently the Division does not stamp or write on the final set of building plans to indicate that the plans have been approved or return a set of approved plans to the architect.
- **Required Inspections.** We reviewed a sample of 10 completed public school construction projects and found that none of the 10 schools received all of their required inspections. In particular, four of the schools were large projects that required eight different types of inspections by the Division. At the time of our review, two of these schools had received only one of the eight required inspections; one school had received only two inspections; and one school had received only four inspections. Even though the Division had not completed the required inspections for any of the 10 projects, the Division had issued certificates of occupancy to all but one of the schools allowing the buildings to be occupied.
- **Code Violations.** Our contractor observed the Division's inspector conduct 7 building inspections and found that the Division did not identify a total of 17 building code violations at 2 of the 7 schools. Violations included missing exterior egress lighting and exit signs, a fire wall that did not meet structural stability requirements, and a classroom that did not have the required number of exits. These two schools were occupied at the time of the inspection.

- **Documentation.** We reviewed a sample of 20 projects and found (1) no documentation in the files for any of the projects to show that plan reviews had occurred and any violations noted during the reviews had been corrected, (2) no documentation to show what inspections the Division conducted and the results of those inspections, and (3) the files for 5 projects did not contain copies of all of the reports of inspections conducted by other agencies. Without documentation we were unable to determine whether the plan reviews and inspections for these projects actually occurred and whether any issues or violations identified were corrected.
- **Resources.** Currently the Division has only one staff person dedicated to conducting building plan reviews and another staff person dedicated to conducting inspections for about 150 construction projects submitted annually. In contrast, many local building departments allocate significantly more resources to plan reviews and inspections. The Division should conduct a comprehensive evaluation of the resources needed to perform its statutory duties to help ensure public safety with respect to school construction and consider a range of options to ensure that sufficient oversight of public school construction projects occurs.
- **Fees.** We reviewed the Division's fee schedule for public school construction projects and found (1) the fee schedule does not cover the costs associated with conducting all required inspections and (2) although the fee schedule is similar to industry practice, it is not clear the schedule complies with statute.

Other Public Safety Functions

Carnivals and Amusement Parks

We reviewed the Division's registration, permitting, and oversight practices with respect to carnivals and amusement parks and identified the following issues:

- **Registration.** We reviewed the Division's registration records for carnivals and amusement parks operating in Colorado and found that 10 of the 26 carnivals and amusement parks on file with the Division as of April 2006 had expired registrations. Of these 10, there were 3 that were actively operating at the time their registration had expired. We also identified three carnivals that operated in Colorado during 2005 but had never been registered with the Division and at least four amusement parks that operate small-gauge railroads that were not registered.
- **Permitting.** We reviewed the Division's permitting process for carnivals and amusement parks and found that 25 of the 26 applications on file with the Division were missing at least one piece of the required documentation, with some applications missing more than one item. For example, 12 of the applications did not include a copy of the owner's insurance policy and 12 applications did not provide accident histories.
- **Oversight.** The Division's oversight of carnival and amusement park operations, as currently structured, is not sufficiently protecting the public. Either the Division needs to restructure its program to strengthen oversight and enforcement of its regulations and seek statutory clarification and funding, as appropriate, or work with the General Assembly to eliminate the Division's responsibility for regulating carnivals and amusement parks.

Explosives

We reviewed the Division's oversight of explosives and the individuals and businesses who use, manufacture, possess, sell, store, transport, or dispose of explosives and found that some of the Division's permitting and inspection functions are duplicating functions currently performed by the Federal Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATFE). For example, both the Division and the ATFE (1) establish regulations related to the use, manufacture, purchase, possession, sale, storage, transportation, and disposal of explosive materials in the State of Colorado; (2) issue permits or licenses to businesses involved in explosives and conduct criminal history checks on all individuals who use or handle explosives; and (3) conduct routine inspections of storage magazines, including reviewing inventory and blast records and visually inspecting the location and construction of the magazine. Further, we found that for some of the areas where duplication exists, the ATFE may be providing more comprehensive oversight than the Division.

Boilers

We reviewed the Division's inspection and enforcement functions related to boilers and identified the following issues:

- **Inspections.** We reviewed a sample of 60 boilers that had a total of 157 inspections conducted over a six-year period and found that 57 of the 157 (36 percent) inspections were late or did not occur within the required inspection interval. More specifically, 22 inspections (14 percent) were up to 1 month late, 24 inspections (15 percent) were up to 6 months late, 6 inspections (4 percent) were up to 1 year late, and the remaining 5 (3 percent) were never inspected within the required inspection interval.
- **Violations.** We reviewed violations identified during 26 inspections conducted between January 2000 and March 2006 for a sample of 18 boilers. We found that for 25 of the inspections, the owners either failed to submit a notice of correction in a timely manner or failed to submit a notice altogether. However, the Division did not shut these boilers down or pursue criminal charges against the owners, as authorized by statute.

Administration

We reviewed the Division's controls over cash collections and access to automated systems and identified control weaknesses that increase the risk of errors and irregularities. More specifically, we identified a lack of segregation of duties, cash receipt logs, and reconciliations and management review for cash collections. We also found that access to the Division's databases was not restricted based on employment status and job duties and that 30 current and former employees and inspectors had inappropriate access.

Our recommendations and the responses of the Division of Oil and Public Safety can be found in the Recommendation Locator and in the body of the report.

RECOMMENDATION LOCATOR
Agency Addressed: The Division of Oil and Public Safety

Rec. No.	Page No.	Recommendation Summary	Agency Response	Implementation Date
1	21	Ensure staff are experienced and receive adequate training for conducting plan reviews; develop and implement standard comprehensive checklists to use as a guide to ensure all components of the plan review are addressed; and review the life-safety issues identified in our sample and, as necessary, notify and work with the districts to develop appropriate remedies.	Agree	January 2008
2	24	Require architects and engineers to submit all required information with the building plans; review the information for sufficiency and compliance with the building codes, resolve any deficiencies, and document the Division’s approval on the final building plan; and review the life-safety issues identified during the audit and, as necessary, notify and work with the districts to develop appropriate remedies.	Agree	January 2008
3	26	Implement a process for ensuring that final building plans are stamped “reviewed for compliance” and a copy is sent back to the architect, and verify that the approved plans are on-site and refer to them during inspections. If plans are not on-site, take enforcement actions for noncompliance.	Agree	January 2008
4	28	Evaluate controls for ensuring that building permits and certificates of occupancy are issued appropriately.	Agree	August 2007
5	33	Ensure that public schools receive all required building inspections prior to issuing a certificate of occupancy and allowing a school to be occupied; track and analyze past and current construction projects to estimate the number of inspections that need to be conducted, the time required to conduct those inspections, and requirements for follow-up; and use this information when assessing options for addressing resource issues.	Agree	January 2008

RECOMMENDATION LOCATOR
Agency Addressed: The Division of Oil and Public Safety

Rec. No.	Page No.	Recommendation Summary	Agency Response	Implementation Date
6	35	Ensure staff have experience and are adequately trained for conducting inspections; develop standard checklists to use when conducting inspections; and review the exceptions identified during the audit related to life-safety issues and, as necessary, notify and work with the districts to develop appropriate remedies.	Agree	January 2008
7	39	Work with the school district contractors to ensure that all areas to be inspected are accessible at the time of inspection and, if not, that a follow-up inspection is conducted; inspect buildings to ensure they comply with energy efficiency requirements; and work with other inspection agencies to determine what areas are being inspected, identify any gaps, and ensure that an assigned agency is completing all required inspections.	Agree	October 2008
8	42	Develop a systematic method for documenting plan reviews and inspections; provide copies of inspection reports to the school district and building contractor; ensure all inspections conducted by either the Division or other state agencies are maintained in the Division's files and periodically reviewed for completeness; and follow up with agencies to obtain copies of missing inspection reports for the five projects in our sample.	Agree	January 2008
9	45	Conduct a comprehensive evaluation of the Division's resources and determine the resources needed to conduct all plan reviews and inspections for public school construction projects.	Agree	July 2008
10	48	Reevaluate the Division's fees to ensure they comply with the statute and sufficiently cover the costs of overseeing public school construction projects, and work with the General Assembly to amend the statute to allow the Division to establish all fees by rule.	Agree	July 2008

RECOMMENDATION LOCATOR
Agency Addressed: The Division of Oil and Public Safety

Rec. No.	Page No.	Recommendation Summary	Agency Response	Implementation Date
11	52	Work with county fair boards to provide information about the Division's registration requirements and identify unregistered carnivals; send follow-up letters to carnivals and amusement parks when permits expire, and take enforcement action when needed; and revise rules to require amusement parks to register annually by a specific date and carnivals to register at least 30 days prior to operation.	Agree	July 2008
12	56	Improve the process for tracking documentation received with registration applications; establish formal follow-up procedures for requesting missing documentation and take enforcement action against carnivals and amusement parks that do not provide complete information; and revise the permit application; and use a risk-based approach to follow up and independently verify accident histories.	Agree	July 2008
13	59	Conduct periodic on-site reviews of inspection records using a risk-based approach, and take enforcement action against carnivals and amusement parks that do not comply with the Division's inspection and record-keeping requirements.	Agree	January 2008
14	61	Establish minimum standards for inspector training, education, and experience and ensure inspectors meet these standards.	Agree	July 2008
15	65	Work with the General Assembly to determine the State's role in overseeing carnivals and amusement parks.	Agree	July 2008
16	72	Work with the General Assembly to redefine the State's role in overseeing explosives and the Federal Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATFE) to identify areas of duplication between the two programs, and rely on the ATFE for certain regulatory functions.	Agree	July 2009

RECOMMENDATION LOCATOR
Agency Addressed: The Division of Oil and Public Safety

Rec. No.	Page No.	Recommendation Summary	Agency Response	Implementation Date
17	72	For areas where the Division retains responsibility for regulating the Explosives Program, improve monitoring and enforcement to ensure permit renewals and inspections are timely, violations are documented, and follow-up and enforcement actions occur; and seek statutory authority to assess civil penalties against permittees who fail to comply with statute and Division regulations.	Agree	July 2008
18	76	Reevaluate the process for conducting boiler inspections to target resources more effectively and improve the timeliness of routine inspections.	Agree	July 2008
19	79	Ensure boiler owners are notified when they do not provide confirmations that violations have been corrected, ensure boiler inspectors update records when a follow-up inspection occurs, and seek statutory authority to assess civil penalties against owners who fail to correct violations in a timely manner.	Agree	July 2008
20	85	Reevaluate and streamline transaction processing to ensure that the appropriate segregation of duties and cash handling procedures have been implemented and that cash reconciliations are performed.	Agree	January 2008
21	89	Establish standard procedures for periodically reviewing user accounts and creating and approving system passwords and address the problems identified related to system access.	Agree	January 2008

Description of the Division of Oil and Public Safety

Background

The Division of Oil and Public Safety (Division) is located within the Department of Labor and Employment. In accordance with the statute (Section 8-20-101, C.R.S.), the Division is responsible for a variety of regulatory functions related to public health and safety, including establishing and enforcing rules and regulations, and enforcing statutes governing public school construction, carnival and amusement park rides, explosives, boilers, underground and aboveground petroleum storage tanks, cleanup of oil spills, and reimbursement of cleanup costs to qualifying storage tank owner/operators.

The Division's mission is "to maximize the protection of consumers, retailers, refiners of petroleum products, users of explosives, boiler owners, and public school students in the areas of safety, product quality, accurate measurement, and safe building design." The Division's oversight of these areas is intended to ensure that the public is adequately safeguarded against property damage, injuries, and deaths. This audit focuses on the Division's regulation and oversight of four of the Division's public safety functions (1) public school construction, (2) carnival and amusement park rides, (3) explosives, and (4) boilers. The Division's oversight of petroleum storage tanks and cleanup of contaminants caused by releases from storage tanks was discussed in the Division of Oil and Public Safety Petroleum Storage Tank Program Performance Audit issued by the Office of the State Auditor and released by the Legislative Audit Committee in October 2006.

Public Safety Programs

The Division's public safety programs were established at different points in time. The Boiler Program was established in 1889, the Public School Construction Program was established in 1964, the Explosives Program was established in 1970, and the Carnival and Amusement Park Program was established in 1975. The Division of Oil and Public Safety was statutorily created in 2001 under Section 8-20-101, C.R.S., when the public safety programs were assigned to the Division. Each program is described below.

Public School Construction Program

The Public School Construction Program oversees the construction of public school projects for all K-12 and junior colleges statewide. The Division does not oversee construction of state-funded community colleges, state colleges, or universities. The Office of the State Architect, within the Department of Personnel & Administration, oversees community college construction projects, while local building departments oversee state college and university construction projects. According to the statutes (Sections 22-32-124 and 23-71-122, C.R.S.), the Division is responsible for adopting building code standards for public schools and junior colleges, reviewing and approving building construction plans, issuing building permits, inspecting the schools throughout the construction phase to ensure the schools have been designed and built in compliance with building codes, and issuing certificates allowing the schools to be occupied. The Division currently requires that all school districts use the 2003 International Building Code for any public school or junior college construction project. During Fiscal Years 2005 and 2006 the Division reviewed and approved a total of 305 school construction projects. This included brand new schools, additions, remodels, and freestanding structures, such as modular classrooms and Tuff sheds. The Division has allocated 2.5 FTE to this program.

Carnival and Amusement Park Program

The Carnival and Amusement Park Program oversees the operation of mechanical rides operated by carnivals and amusement parks. According to the statute (Section 8-20-101(3), C.R.S.), the Division is required to “ascertain, fix, and order such reasonable standards or rules for the construction, repair, and maintenance of carnivals and amusement parks and provide for annual registration fees, not to exceed one hundred dollars, and for the financial responsibilities of operators.” The Division’s regulations require that carnivals and amusement parks register annually with the Division prior to operation. The Division’s registration process is intended to ensure that carnivals and amusement parks have received the required annual inspections for all rides, obtained adequate insurance in the case of an accident, and reported all accidents to the Division. As of April 2006, there were 26 carnivals and amusement parks registered with the Division. The Division has allocated 0.3 FTE to this program.

Explosives Program

The Explosives Program oversees individuals and businesses that handle or work with explosives. According to the statute (Section 9-7-105, C.R.S.), the Division is required to “promulgate rules and regulations to implement the provisions of this

article . . . which are reasonably necessary for the safety of workers, the public, and the protection of property.” The statute (Section 9-7-106, C.R.S.) and the Division’s regulations require any person or business that manufactures, sells, purchases, stores, transports, or uses explosives to obtain a permit from the Division. In order to obtain a permit, applicants are required to meet certain requirements, which may include passing a criminal history check and an exam on the use of explosives or undergoing an inspection by the Division of any explosive storage facility, also called a magazine. Permits are valid for three years. As of July 2006, the Division reports that it had over 1,700 active explosive permits. The Division has 0.7 FTE dedicated to this program.

Boiler Program

The Boiler Program is responsible for establishing standards for operating boilers and conducting boiler inspections. Specifically, the statute (Section 9-4-103(1), C.R.S.), requires that the Division establish rules for the safe construction, installation, inspection, operation, maintenance, and repair of all boilers. Each boiler is required to be inspected annually or biennially, as determined by the Division. Boiler inspections are performed by either the Division’s inspectors or an insurance company that insures boilers. Once a boiler passes inspection, the Division issues an inspection certificate to the owner. The Division reports that as of June 2006, about 29,000 active boilers requiring inspection were registered with the Division. The Division has allocated about 7.5 FTE to this program.

Fiscal Overview

The Division’s public safety programs are entirely cash-funded by fees from the various activities it regulates. Each program assesses a different fee for the Division’s services. For example, the Explosives Program assesses one permit fee of \$75 every three years. Boilers, however, have various fees depending on the type of boiler and the type of inspection. These fees range from \$20 to \$125. The Public School Construction Program bases its fees on the estimated cost of the school building project. Fees range from \$50 for projects costing up to \$2,000 to more than \$10,000 for projects costing in excess of \$64 million. Finally, the Carnival and Amusement Park Program has an annual registration fee of \$100. The following table shows the Division’s revenue and expenditures for each public safety program for Fiscal Years 2004 through 2006.

Division of Oil and Public Safety Public Safety Programs Revenue and Expenditures Fiscal Years 2004 Through 2006					
		2004	2005²	2006²	Percent Change (2004- 2006)
Revenue	Boilers	\$1,476,100	\$1,304,800	\$934,200	(37%)
	Public School Construction	\$218,600	\$191,900	\$302,100	38%
	Explosives	\$56,400	\$41,000	\$36,800	(35%)
	Carnivals and Amusement Parks	\$1,300	\$2,200	\$2,800	115%
	Total Revenue	\$1,752,400	\$1,539,900	\$1,275,900	(27%)
Expenditures	Boilers	\$1,098,500	\$1,321,600	\$1,150,200	5%
	Other Programs ¹	\$363,800	\$292,300	\$279,600	(23%)
	Total Expenditures	\$1,462,300	\$1,613,900	\$1,429,800	(2%)
Source: Colorado Financial Reporting System (COFRS) data.					
¹ Other Programs include the Public School Construction, Explosives, and Carnival and Amusement Park Programs. The Division does not break out expenditures separately for these programs.					
² Reserves in the Public Safety Inspection Fund and the Boiler Fund covered the shortfall in revenue for Fiscal Years 2005 and 2006.					

In addition to the revenue listed above, the Division receives revenue from the Division's Petroleum Storage Tank Program. This Program is funded by cash and federal funds. In Fiscal Year 2006 the Division's total revenue was about \$42 million and total expenditures were about \$36.8 million. The Division's expenditures included about \$31.3 million in cleanup costs related to the Division's Petroleum Storage Tank Program and about \$4.2 million in costs associated with staff salaries and benefits and operating expenses for the entire Division. In Fiscal Year 2006 the Division was appropriated 53.3 FTE altogether.

Audit Scope

This report discusses the Division's oversight of four of its public safety programs. As part of the audit, we reviewed statutory requirements, analyzed data, and interviewed Division and Department of Labor and Employment staff. We also surveyed other states' practices related to boilers and carnivals and amusement parks. These states included Arizona, Maine, Massachusetts, Michigan, Montana, New Hampshire, New Jersey, North Carolina, Ohio, Texas, and Wyoming. Additionally, we surveyed the Office of the State Architect within the Department of Personnel & Administration and several Colorado local government building departments' plan review and inspection practices. These local governments included Adams County, Aurora, Castle Rock, Colorado Springs, Denver, Fort Collins, Grand Junction, Greeley, Greenwood Village, Lakewood, Littleton, Longmont, Pueblo, and Thornton. Finally, we reviewed the Federal Bureau of Alcohol, Tobacco, Firearms, and Explosives' practices related to explosives.

As mentioned earlier, this report does not cover our review of the Division's Petroleum Storage Tank Program. The Division of Oil and Public Safety Petroleum Storage Tank Program Performance Audit was issued by the Office of the State Auditor and released by the Legislative Audit Committee in October 2006.

Public School Construction

Chapter 1

Background

In Colorado, the construction of residential and commercial buildings is overseen and regulated by local government building departments. However, construction of K-12 public schools and junior colleges is regulated by the Division of Oil and Public Safety (Division). Public school construction projects include building new schools or additions to existing schools, remodeling or renovating existing schools, and constructing modular classrooms. During Fiscal Year 2006 about \$10.9 million in state funds (not including local school district bonds) was spent on public school construction projects statewide.

The Division's Public School Construction Program began in 1964. The statutes (Sections 22-32-124(1) and 23-71-122(1)(v)(I), C.R.S.) require that "all [school] buildings and structures shall be constructed in conformity with the building and fire codes adopted by the Director of the Division of Oil and Public Safety" The Division has adopted the 2003 International Building Code (the building code) as the standard by which all public schools and junior colleges must be constructed. The building code includes standards for structural integrity, energy compliance, and fire resistance. The Division's responsibilities include reviewing and approving building plans, issuing permits, and conducting inspections. Annually, the Division approves approximately 150 construction projects and receives approximately \$247,000 in fees related to these projects.

We reviewed the Division's Public School Construction Program to determine whether the Division is sufficiently protecting the safety of students and staff in Colorado public schools and junior colleges by adequately permitting and inspecting construction projects and properly enforcing building codes. We also reviewed program fees to determine whether they are sufficient to support the Program. Further, we contracted with Colorado Inspection Agency, a private company that conducts plan reviews and inspections of residential and commercial projects for several local building departments, some of which follow the 2003 International Building Code. Our contractor reviewed the Division's processes related to public school construction projects to determine whether the Division's staff are conducting plan reviews and inspections in accordance with the building code.

We identified weaknesses in Division practices for overseeing public school construction projects in all areas—from initial plan review through the final building inspection. Additionally, we found the Division has dedicated insufficient resources and expertise to its oversight responsibilities. Overall, the problems we found raise significant concerns about (1) the value the Division is adding through its Public School Construction Program and (2) the Division’s ability to ensure public schools are constructed in accordance with the building code and are safe for the children and adults who occupy them. In this chapter we discuss the problems we identified with the Division’s processes for reviewing building plans, issuing permits, conducting required inspections, and documenting its work. Weak controls, insufficient resources, and lack of expertise contributed to the problems we observed in all of these areas. We discuss alternatives for restructuring the Division’s public school construction functions and obtaining resources for increased oversight at the end of this chapter.

Building Plan Reviews

At the start of a construction project, the school district (generally the public school’s facilities manager) will hire an architect and an engineer to design the school project. The architect will produce drawings, or building plans, that show, in detail, how the building will be constructed. The architect is required to design the project in accordance with the 2003 International Building Code, the building code adopted by the Division. This code covers multiple areas of construction, including electrical, plumbing, fire safety, energy efficiency, mechanical, and structural. The purpose of the building code is, “to establish minimum requirements to safeguard the public health, safety, and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations.”

Once the building plans are completed, public schools are required to apply for and obtain a building permit from the Division for any school construction project prior to beginning construction. As part of the permitting process, the general contractor or school facilities manager must submit an application for a permit to the Division along with the building plans. The Division is responsible for reviewing the building plans and comparing them with the building code to determine whether code requirements are met and whether the design is safe and energy-efficient. Certain documents and information are required to be submitted on or with the building plans. These include a list of all special inspections that will be required of the project (e.g., welding or concrete inspections), documentation showing how the mechanical systems are in compliance with the building code, and documentation

showing that the building meets energy efficiency requirements. The Division is responsible for reviewing and approving the plans, including any supporting information and documentation, and comparing the plans and the supporting documentation with the building code to determine whether code requirements were met and whether the design is safe and energy-efficient. Once the Division reviews and approves the building plans, it issues a permit allowing construction to begin. Currently the Division has one FTE who conducts plan reviews for the approximately 150 public school construction projects submitted to the Division each year.

We contracted with Colorado Inspection Agency to review the building plans for a sample of 10 public school construction projects (5 completed and 5 in progress). The purpose of our contractor's review was to determine whether the Division had correctly applied the building code and identified any code violations. The building plans for these projects had already been reviewed and approved by the Division. Our contractor found that for these 10 projects, the Division did not consistently apply the building code correctly or review all necessary documentation that is required to be submitted with the building plans. These issues are discussed below.

Application of Building Code

When designing a building, or rooms within a building, the architect must consider how the space will be used and how many people will occupy the space. These factors impact fire safety, egress, accessibility, and sanitation issues. The estimate of the number of people who will occupy a space is called the "occupancy load," and this number is used to determine how the plans should address exiting the building in the case of an emergency (e.g., number of exits and the width of the corridors), the need for an automatic sprinkler system, sanitation issues (e.g., number of toilets, sinks, and water fountains), and the type of fire-rated construction needed. The building code includes requirements for how a building must be constructed to help prevent the spread of fire. According to the code, certain walls must be able to withstand a fire and remain standing for a period of time to allow occupants to escape before the walls burn down. Other walls, called "fire walls," are required to keep fire from spreading from one building or room to another. Additionally, certain materials, such as plywood, are not allowed to be used in fire-rated construction areas because they are combustible. Fire-rated construction and fire-rated walls are assigned a rating of one-hour, two-hour, etc., which means that they will stop the spread of a fire for that period of time to allow all occupants to escape. Finally, the building code includes a multitude of requirements related to accessibility issues for persons with physical disabilities and general building safety, such as structural stability, ventilation, handrails, and guardrails.

Our contractor reviewed each of the 10 building plans in our sample that had been approved by the Division to determine if the Division adequately identified all building code issues. Some of these projects have already been completed and are occupied by students and staff, while others are still under construction. Of the 10 projects reviewed, our contractor found that all 10 projects had at least 70 code issues that the Division did not identify as a problem during its review of the building plans. These included significant issues related to fire safety, egress, accessibility, and general safety. For example:

- The plans for one middle school incorrectly labeled a basement as a crawl space. According to the building code, if a person can stand in a space it cannot be considered a “crawl space” and instead must be classified as a basement. If an area is classified as a basement, the building code requires that the area have an automatic sprinkler system and that the heating and air ducts be contained in a one-hour fire-rated shaft to prevent the spread of fire. In this case, the area labeled as a “crawl space” in the building plans and approved as a “crawl space” by the Division had one large room with at least an eight-foot-high ceiling, a boiler, and mechanical heating and air-conditioning units. The space also had two flights of stairs and an overhead door large enough for a vehicle to enter. Since the area was labeled and approved as a “crawl space,” the assumption was that the space would not be occupied. As a result, the plans did not include a sprinkler system or fire-rated shafts as required by code. Our contractor’s conclusion that the crawl space should have been classified as a basement was confirmed by a code opinion obtained from the International Code Council (ICC), the organization that issues the 2003 International Building Code. The ICC also stated that the area does not qualify as a crawl space because it has headroom, which automatically requires an occupancy classification to be assigned. According to our contractor, if a fire were to start in the area, it would spread quickly to the rest of the building and could cause serious injuries or fatalities since the floor separating the area and the first floor is not sufficiently fire-rated. At the time of our audit, this project was under construction.
- The plans for a high school included the addition of a new gymnasium that was connected to the existing building by a covered walkway. According to code, the gymnasium wall closest to the existing building was required to be a fire wall. Although the building plans indicated that the wall was a fire wall, the plans did not include any information on how the wall would be constructed as required by code. In addition, code requires both the walls in the walkway between the gymnasium and the existing school and the doors in the gymnasium to be fire-rated. The plans did not show the proper fire-rated construction for these walls or doors. Also, the walls of a wrestling room within the gymnasium were required to be built using noncombustible

construction. The plans, however, showed that combustible materials would be used for the walls in the wrestling room. Finally, the plans showed showers that did not allow for wheelchair access. The Division did not identify any of these issues as a problem during its plan review. Construction has been completed for this project and the building has been approved for occupancy by the Division.

- The plans for a school administration building included an occupancy load calculation for the entire building that was erroneously low. Specifically, the architect did not correctly classify the use of the building and factor in the maximum number of potential occupants in the building based on that classification. As a result, the building was built without an automatic sprinkler system. If the correct occupancy load had been calculated, code would require that the building include an automatic sprinkler system. Additionally, the plans showed that, structurally, the building was built using less stringent wind speed calculations than code requires. As a result, the building may not be able to structurally withstand high wind speeds. The Division did not identify these problems during its plan review. At the time of our audit, this project was under construction.
- The plans for a middle school included a two-hour fire wall that did not have the required bracing and connections to ensure it would not collapse in less than two hours if a fire were to occur. The Division did not identify this problem during its plan review. Construction has been completed for this project and the building has been approved for occupancy by the Division.
- The plans for an elementary school included an occupancy load calculation for two kindergarten classrooms that was erroneously low. According to the building plans, each room had only one exit. If the correct calculation had been used, code would require that each room have two exits. The Division did not identify this as a problem during its plan review. Construction has been completed for this project and the building has been approved for occupancy by the Division.
- The plans for an elementary school included a gymnasium that is also used as the seating area for a stage and music room. The occupancy load for the gymnasium requires three exits. The gymnasium was constructed with only two exits. The plans for this school also included a kitchen that had a hood above the stove that was installed too close to combustible material. In addition, the ceiling was not constructed of fire-rated materials as required by code. The Division did not identify this as a problem during its plan review. Construction has been completed on this project and the building has been approved for occupancy by the Division.

- The plans for a high school included the construction of a new auditorium but did not show proper fire-rated construction between the stage and an adjoining costume/scene room as required by code. The plans also included a two-hour fire wall that did not have the required bracing and connections to ensure it would not collapse in less than two hours if a fire were to occur. In addition, the plans did not include the required handrails next to stairways. The lack of handrails, particularly in schools, could increase the risk of injuries related to falls. The Division did not identify these problems during its plan review. At the time of our audit, this project was under construction.

Buildings that are not designed appropriately, taking into account all code requirements, pose a risk to the health and safety of their occupants. Specifically, buildings that do not have the appropriate fire-rated construction represent a significant life-safety risk to the students and staff. If a fire were to occur, it could rapidly spread throughout the building and to other structures, resulting in serious injury to people and property. In addition, without adequate egress from the building, if an emergency were to occur, the occupants may not be able to safely exit the building.

The Division has been statutorily charged with the responsibility to ensure that public schools in the State are built safely and in accordance with the building code. The Division needs to take several steps to ensure its plan reviews are sufficient for identifying all code issues in the future. First, the Division needs to ensure staff are adequately trained to conduct plan reviews and have resources available for obtaining help with code issues. As mentioned previously, the Division has one staff member who conducts all 150 of the plan reviews received each year for public school construction projects. This staff member first began conducting reviews in October 2005. Prior to this time, he was working in the Division's Oil Remediation Section. According to our contractor, applying the building code can sometimes involve interpreting the intent of the code. As a result, learning to review building plans and apply the building code correctly and in accordance with industry practice requires a number of years of experience conducting plan reviews. Additionally, having highly experienced staff members or external resources available to respond to questions and help resolve code issues is critical.

Several of the local government building departments we contacted require their employees to have between two and five years of experience conducting plan reviews and one or more certifications from the International Code Council. In March 2006 the Division's plans reviewer received certification as a plans examiner and building inspector from the International Code Council. According to our contractor, these certifications will assist the Division's plan reviewer with properly applying the building code to plan reviews. However, since the plan reviewer has less than a year and a half of experience conducting plan reviews, continual

education and training is also needed. The International Code Council offers several training programs and certifications in a variety of code areas, such as building accessibility. In addition, several local private plan review and inspection companies offer training courses in applying the building code for plan reviews. The Division should review these courses and require staff to attend those that would provide the most benefit. Additionally, the Division will need to assess the resources needed to conduct high-quality and thorough plan reviews as discussed further in Recommendation No. 9.

Second, the Division needs to develop a mechanism to ensure all code issues are identified during plan reviews. This may include developing and implementing more useful and comprehensive checklists to help guide staff's review of building plans. Although the Division has developed some checklists, these checklists are not comprehensive. The Division has indicated that it does not use them for plan reviews because there are a multitude of different areas that must be checked and a variety of violations that might be found, and thus a checklist format is not reasonable for documenting reviews and inspections. According to our contractor, checklists are a primary tool for standardizing the plan review process to ensure the code is being applied correctly and consistently across all projects. The Division should ensure that any deficiencies identified during its plan reviews are resolved prior to approving the project plan. Finally, the Division should review the life-safety issues identified by our contractor and work with the districts, as needed, to develop the appropriate remedies.

Recommendation No. 1:

The Division of Oil and Public Safety should improve its process for conducting plan reviews for public school construction projects by ensuring staff are experienced and receive adequate training for conducting plan reviews, developing and implementing standard comprehensive checklists to use as a guide to ensure all components of the plan review are addressed, and resolving any deficiencies identified during the review prior to approving the project plan. The Division should review the life-safety issues identified for the schools in our sample and, as necessary, notify and work with the districts to develop the appropriate remedies.

Division of Oil and Public Safety Response:

Agree. Implementation date: January 2008.

The Division will hire an experienced Public School Construction Program manager by July 1, 2007, to oversee the work products completed by the staff, including resolving any deficiencies identified during plan reviews

prior to issuing a permit. This position will develop and implement a training program for conducting plan reviews and develop and implement standard comprehensive checklists to ensure all components of the plan review are addressed. The Division will review the life-safety issues identified for the schools in the audit sample and, as necessary, notify and work with the districts to develop the appropriate remedies.

Building Plan Documentation

The building code requires that architects and engineers include additional documentation with building plans when they are submitted to the Division for review and approval. This documentation includes a list of the special inspections that will be required on a project and information showing the project's compliance with energy efficiency and mechanical system requirements. Our contractor reviewed the Division's files and the building plans for our sample of 10 projects that had been approved by the Division to determine if all required documentation was submitted with the plans. Of the 10 projects reviewed, our contractor found that 5 projects did not include all of the required documentation. The Division approved the plans for these five projects without obtaining the additional documentation. Specifically, our contractor found the following documentation was missing from the building plans:

Special Inspections. In addition to the standard inspections required for all construction projects, the building code requires special inspections for certain types of projects. This includes projects where welding, high-strength bolting, masonry, structural concrete, and spray-on fire resistance are required. For prefabricated buildings, special inspections should be conducted in the plant at the time the building is being manufactured and then on-site as the structure is built to ensure it is properly assembled and bolted. When a project requires special inspections, the building code requires the architect and engineer to list the special inspections that will occur prior to construction (i.e., in the manufacturing plant) and should occur (i.e., on-site during construction) on the building plans, and include the names of the firms responsible for conducting the inspections. This information is necessary so that the building contractor will know what special inspections are required for the project and the Division can verify that all required special inspections either have occurred or are scheduled to occur. Once the project is complete, the Division is required to verify through inspection reports that the special inspections required for the project actually occurred prior to issuing a certificate of occupancy and approving the building for occupancy.

Of the 10 projects reviewed by our contractor, 3 required special inspections. Our contractor reviewed the building plans and the Division's files for these three projects and found no list of planned special inspections either on the plans or in the files. Additionally, as discussed later in this chapter, our contractor could find no documentation to verify that the special inspections actually occurred on these three projects. For example, the building plans for a high school project included the installation of a prefabricated metal gymnasium. This type of project generally includes special inspections for welding, structural concrete, and high-strength bolting. The plans, however, did not list any special inspections that were scheduled for the building. In addition, the Division's files for this project did not include any documentation to show that special inspections occurred. At the time of our review, construction had been completed on this project. If the required special inspections are not listed on the building plans and provided to the Division, the Division cannot ensure that the building contractor is aware of these inspections and verify that the inspections actually occurred. If a building is defectively assembled and the necessary special inspections are not conducted, the occupants could be at risk of sustaining serious injury if the building were to become unstable and collapse.

Energy Efficiency. The building code requires that all school buildings be designed to meet certain standards for energy efficiency. The architects and engineers are required to prepare schedules showing how the building meets these standards and submit these schedules to the Division with the building plans for review and approval. Energy efficiency schedules were required for 4 of the 10 projects our contractor reviewed. For the other six projects, the plans had sufficient information for determining compliance with energy efficiency standards. Our contractor reviewed the Division's files and the approved building plans for these four projects requiring energy efficiency schedules and found that the schedules were not submitted for any of the projects. Without this documentation, the Division cannot ensure that buildings are constructed as efficiently as possible so that taxpayers are not spending more than is necessary on heating and air-conditioning schools.

Mechanical Systems. The building code includes standards related to heating, ventilation, cooling, and refrigeration systems. These standards include requirements for the size of gas lines, the rate of outside airflow into the systems, and the location of shut-off switches. The building plans are required to show how these requirements will be met. Our contractor found the building plans for 3 of the 10 projects reviewed did not provide complete information related to the mechanical systems. For example, the plans for a school administration building showed that heating and air-conditioning units would be installed on the roof of the building. The plans, however, did not specify how these units met the code requirements to ensure proper circulation of outside air. If air is not properly circulated through the system, any air contaminated with cold viruses, etc. will continue to be circulated back into the building.

According to Division staff, it has not required architects and engineers to submit information on special inspections and energy efficiency schedules or consistently requested information on the mechanical systems when it was not submitted with the building plans because staff do not have time to review this additional information. Division staff report that, instead, the Division has tried to focus its limited resources on reviewing building plans for life-safety issues. We discuss alternatives for addressing the Division's resource issues in more detail in Recommendation No. 9.

Special inspections, mechanical systems, and energy efficiency schedules are important components of the building code that in some instances could affect life-safety issues and, therefore, should be included in the plan review. The Division needs to follow up with architects and engineers to ensure they submit all required supporting documentation with their building plans. The Division also needs to review the supporting information and documentation for compliance with the building code and document its approval on the final building plan. The Division should review the exceptions identified by our contractor and, as necessary, work with the districts to develop the appropriate remedies.

Recommendation No. 2:

The Division of Oil and Public Safety should ensure building plans for public schools are adequately reviewed and approved with regard to special inspections, mechanical systems, and energy efficiency by requiring architects and engineers to submit all required information with the building plans, reviewing the information for sufficiency and compliance with the building code, resolving any deficiencies, and documenting its approval on the final building plan. The Division should review the exceptions identified by the audit involving life-safety issues and, as necessary, notify and work with the districts to develop the appropriate remedies.

Division of Oil and Public Safety Response:

Agree. Implementation date: January 2008.

The Division will hire an experienced Public School Construction Program manager by July 1, 2007, to ensure building plans for public schools are adequately reviewed and approved with regard to special inspections, mechanical systems, and energy efficiency by requiring architects and engineers to submit all required information with the building plans, reviewing the information for sufficiency and compliance with the building code, resolving any deficiencies, and documenting its approval on the final building plan. The Division will review the exceptions identified by our

contractor involving life-safety issues and, as necessary, notify and work with the districts to develop the appropriate remedies.

Approved Building Plans

According to the building code, once the Division reviews and approves the building plans for a school project, the Division is required to stamp or write on the final set of building plans “reviewed for code compliance.” One stamped copy of the plans is required to be retained by the Division and another stamped copy is required to be returned to the architect. According to the building code, the approved set of building plans is required to be located at the project work site and used when constructing and inspecting the building. Plans must remain on-site until all inspections have been completed. According to our contractor, industry practice is for inspectors, such as Division staff, to carry and refer to the approved plans during any on-site inspections.

As discussed later in this chapter, our contractor conducted seven on-site building inspections with the Division. When conducting these inspections, our contractor reviewed the Division’s procedures for on-site inspections with respect to approved building plans and identified three problems. First, during the inspections, neither the school district’s contractor nor the Division’s inspector knew if the building plans at the work site were the plans the Division had approved, or whether they were one of the earlier versions of the plans that had been subsequently changed due to code violations. This is because the Division does not currently stamp or write on the final set of building plans to indicate that the plans have been reviewed and approved. The Division also does not return a set of stamped approved plans to the architect after conducting its final review. Second, our contractor found that the Division’s inspector did not bring the Division’s set of approved plans to the project work site, nor did he consistently ask to review the building plans that were on-site or refer to the plans during the inspections. The building plans for a school can be very complex and include significant technical details on construction requirements. Therefore, it is important that the Division’s inspector refer to the plans during his inspection to ensure that all requirements are being met. Third, our contractor found that two of the seven schools inspected did not have any building plans at the work site. Although construction was finished on one of the schools, code requires that the approved building plans remain on-site until all inspections are complete. The Division was conducting the final inspection for this school. The Division did not issue a citation to this school for not having plans on-site but rather issued a certificate of occupancy. Construction was still in progress at the other school where the Division conducted the fire penetration inspection. The Division did not issue a citation to this school for not having plans on-site.

It is important that the Division stamp the final, approved set of building plans and return a copy to the architect so that the school district contractor and the Division's inspector know that the plans being used to construct a project have been reviewed and approved for compliance with code. According to the Division, it does not send an approved copy of the plans back to the architect because the Division would have to pay the shipping charges and it does not have the funds to cover this expense. The Division has two options to address this issue. First, the Division could consider adjusting its plan review fees to include the average cost of mailing plans back to the architect. A second option would be to require that the architect include a postage-paid mailing tube with the building plans when they are submitted to the Division for review. The Division could then mail a copy of the stamped approved plans back to the architect in the tube. The Division should also ensure that school district contractors keep the approved set of building plans at the work site and that the Division's inspectors refer to these plans when conducting inspections. If the Division finds that approved plans are not on-site, the Division should follow up with enforcement actions for noncompliance.

Recommendation No. 3:

The Division of Oil and Public Safety should ensure that its Public School Construction Program complies with the building code and industry practice by:

- a. Implementing a process for ensuring that final building plans are stamped "reviewed for compliance" and a copy is sent back to the architect. This could include adjusting plan review fees to cover mailing costs or requiring architects to provide a postage-paid tube for shipping the plans.
- b. Verifying that the approved plans are on-site and referring to them during its inspections. If plans are not on-site, the Division should follow up with enforcement actions for noncompliance.

Division of Oil and Public Safety Response:

Agree. Implementation date: January 2008.

The Division will hire an experienced Public School Construction Program manager by July 1, 2007, to ensure that the program complies with the building code and industry practice in the area of stamping plans "approved" and ensuring a copy of the plan is on-site:

- a. The Division has implemented a process to stamp “approved” on plans prior to issuing a permit. At this time the architect (or designee) is required to pick them up to take them to the project site. The process will be evaluated to determine the best method for ensuring the architect gets a copy. This could include adjusting plan review fees to cover mailing costs or requiring architects to provide a postage-paid tube for shipping the plans.
- b. The Division will verify that the approved plans are on-site and will refer to them during inspections. If plans are not on-site, the Division will follow up with enforcement actions for noncompliance.

Building Permits

Public schools are required to apply for and obtain a building permit from the Division for any school construction project prior to beginning construction. As part of the permitting process, the general contractor or school facilities manager must submit an application for a permit to the Division along with the building plans. As discussed earlier, the Division is responsible for reviewing the building plans and comparing them with the building code to determine whether code requirements are met and whether the design is safe and energy-efficient. Once the Division reviews and approves the plans, the Division issues a permit allowing construction to begin. Throughout the construction phase, the Division is responsible for conducting various inspections to ensure the building is constructed according to the approved building plans and complies with code requirements. After construction is complete, the Division is responsible for conducting a final inspection of the building to ensure there are no visible problems with the building that could pose a health or safety risk if the building were occupied before the problem was corrected. Common life-safety issues that can be identified during a final inspection include missing or inoperable emergency exit lights, doors that are not fire-resistant, and missing or dangerously protruding handrails. Once the final inspection has been completed, the Division issues a certificate of occupancy. This certificate authorizes the building to be occupied.

We observed the Division conduct two on-site inspections of public school construction projects. These two inspections were in addition to the seven inspections our contractor observed as discussed later in this chapter and included visual inspections of heating and air-conditioning systems, fire penetration construction, and building exit signs. During one site inspection, we found that a certificate of occupancy had been erroneously issued for a public school construction project that was still under construction. This project was an addition to the existing

school and required mechanical, structural, and electrical work, as well as installation of a new heating and air-conditioning system. According to the Division, it reviewed and approved the building plans for this project but accidentally printed a certificate of occupancy rather than a building permit. Division staff report that this has happened for other projects as well.

By issuing a certificate of occupancy, the Division is attesting that all building inspections have been conducted and the building is safe and ready to be used. Additionally, if a certificate of occupancy is issued in error and someone is injured, the State could be held financially liable. Currently there is only one staff member who is responsible for reviewing building plans and issuing building permits and certificates of occupancy. There is no management review of the permits or certificates before they are sent out to ensure the correct permit or certificate is issued. Also, the building permit and the certificate of occupancy appear identical except for the heading at the top of the form. This can contribute to the risk that the Division could accidentally issue a certificate allowing the building to be occupied when it intended to issue a building permit. The Division should evaluate various controls that can be put in place to help prevent certificates of occupancy being issued in error. Options include requiring that management review or sign off on permits and certificates of occupancy prior to issuance and changing the appearance of the permit and certificate, such as printing them on different colored paper.

Recommendation No. 4:

The Division of Oil and Public Safety should evaluate controls for ensuring that building permits and certificates of occupancy for public school construction projects are issued appropriately. Options include requiring management to review all building permits and certificates of occupancy before issuance, and changing the appearance of the permits and the certificates so that they can be clearly distinguished.

Division of Oil and Public Safety Response:

Agree. Implementation date: August 2007.

The Division will hire an experienced Public School Construction Program manager by July 1, 2007, to ensure that building permits and certificates of occupancy for public school construction projects are issued appropriately. The new program manager will review all building permits and certificates of occupancy before issuance. The appearance of the permits has been changed so that they can be clearly distinguished.

Building Inspections

Once a building permit is issued and construction is under way, the statute requires the Division to conduct inspections of public schools to ensure that the structural quality and general safety of building construction meets code standards for life safety. According to the statute (Sections 22-32-124(2)(a)(I) and 23-71-122(1)(v)(II)(A), C.R.S.), the Division shall conduct the necessary plan reviews and inspections to assure that a building or structure has been constructed in conformity with the building and fire codes adopted by the Director of the Division.

The 2003 International Building Code and the Division's procedures list various inspections that are required throughout the construction phase of a project. These inspections include footing and foundation (i.e., reviewing the site to ensure that it has been properly excavated and that all structural elements, such as steel and concrete, have been properly installed and poured to support walls and columns so that the building will stand); concrete slab (i.e., ensuring that the soil has been properly prepared for the concrete floor and that the floor is of sufficient depth); lath and gypsum board (i.e., ensuring that walls have the proper fire-resistance rating); fire-resistant penetration (i.e., ensuring that all joints, ceilings, and walls have been properly concealed to prevent the spread of fire where penetration occurs, such as places where conduit and ducts run through the walls of a building); and energy efficiency (i.e., ensuring that the building is properly insulated and that air-conditioning, heating, and lighting systems meet minimum energy usage requirements). As discussed in Chapter 2, the Division is also required to conduct inspections of boilers placed in schools. There are additional inspections, conducted by other state and local agencies, that must occur on public school construction projects. For example, the Division of Fire Safety within the Department of Public Safety conducts certain inspections related to fire prevention and suppression, such as inspections of sprinkler systems. Local fire departments also conduct inspections related to fire protection and prevention, such as inspections of smoke alarms and maintenance of volatile chemicals. The State Plumbing and Electrical Boards, within the Department of Regulatory Agencies, conduct inspections of plumbing and electrical work. The Division requires that school districts submit a copy of the inspection reports issued by these other agencies.

As discussed previously, the last step of the construction process before the structure can be occupied is for the Division of Oil and Public Safety to conduct a final inspection of the building or project. The primary purpose of the final inspection is to verify that all required inspections were conducted and that all visible life-safety issues have been resolved. For example, a final inspection can ensure that there is proper egress (e.g., pathways, lighting, exits) from the building in case of an emergency, that the building and all heating and air-conditioning systems are

properly ventilated to prevent carbon monoxide poisoning, and that prefabricated manufactured buildings have been properly installed so that they are structurally sound and are not at risk of collapsing. Once the final inspection is complete, the Division issues a certificate of occupancy that allows the building to be occupied. Depending on the type of construction involved, there can be up to 14 different types of inspections that are required to be conducted on a school project; 8 of these are required to be performed by the Division. Some smaller projects may only require a final inspection.

As each phase of construction is completed, such as the footing and foundation, the building contractor is required to notify the Division that the structure is ready for an on-site inspection. At the time of our audit, the Division had one full-time employee who conducted inspections. Inspections usually involve reviewing the approved building plans and examining the building to ensure the project has been built in accordance with the building plans. Depending on the size of the project and type of inspection, inspections can take between one hour and a full day.

We reviewed the Division's compliance with statutory requirements for conducting inspections of public school construction projects and found that historically, and at the time of our review, the Division has not been conducting all required building inspections. We also found that when the Division conducts inspections, it does not consistently identify all violations of the building code or conduct a complete inspection. These issues are discussed in the next three sections.

Required Inspections

We reviewed a sample of 10 public school construction projects completed between January and November 2006 and found that none of the schools received all of the required inspections. Even though the Division had not completed the required inspections for any of the 10 projects, including the final inspection, the Division had issued certificates of occupancy to all but one of the schools allowing the buildings to be occupied. Specifically, we found:

- Four of the ten schools in our sample were large projects that required all eight inspections. At the time of our review, two schools had received only one of the eight required inspections, one school had received only two inspections, and one school had received only four inspections. The inspections not conducted included the footing and foundation, frame, gypsum board, and fire penetration. Additionally, at the time of our review three of the four schools had not received the final inspection. All four of these schools were fully occupied at the time of our review.

- Two of the ten schools in our sample required seven of the eight standard inspections. One school had not received any inspections and one school had received only one inspection. At the time of our review, neither school had received a final inspection and both schools were fully occupied.
- Four of the ten schools in our sample were small projects and, according to the Division, required only a final inspection. Three of the four schools had not received the final inspection. All four of these schools were fully occupied at the time of our review.

By not conducting all of the required inspections, the Division cannot ensure that these buildings were constructed in accordance with the approved building plans and the building code and that they are free of significant defects which could result in injury to people or property.

According to the Division, it has not been able to conduct all of the required inspections due to staffing limitations. The Division has tried to ensure that all schools receive, at a minimum, the boiler and final inspections and has, in general, scheduled all other building inspections around the boiler inspections, as time permits. Although the Division's goal has been to conduct the final inspection prior to issuing the certificate of occupancy, the Division has not met this goal. According to the Division's records, as of December 2006, a total of 56 schools, including 7 of the 10 schools in our sample, had already been issued a certificate of occupancy, although they had not received a final inspection by the Division. One school had not received a final inspection nor been issued a certificate of occupancy. Two of the schools in our sample had received final inspections and had been issued certificates of occupancy. Also, according to the Division, due to its limited staffing resources, its inspector will not spend more than a day conducting any building inspection, including the time it takes to travel to the building site. This means that public schools in some parts of the State, such as Durango and Craig, have not typically received any inspections by the Division. According to the Division, even though it may not be able to conduct the required inspections on a school, Division staff ensure that the building has received all of the inspections that other state agencies are required to perform. However, as discussed later in this chapter, we found that these inspections were not consistently documented in the Division's files. Therefore, we could not determine whether these inspections actually occurred.

Building inspections during the various stages of construction are a key control for ensuring that the building has been constructed in accordance with the building code and the approved building plans. If inspections do not occur during each phase of construction, certain parts of the building, such as the internal frame, are covered up. In these cases there is no way to determine if the construction was in compliance with the building code without requiring the contractor to undo the work.

Inspections also help identify problems that can be corrected before the next phase of construction begins. According to our contractor, they typically find several violations during building inspections. Some common violations include inadequate spacing of the steel that is used to reinforce concrete footings and foundations that support the weight of the building; improper soil preparation for concrete footings and foundations; insufficient fire-rating of the building's frame and walls; and problems with accessibility into and out of rooms, lavatories, and the building itself. Due to the seriousness of these violations, it is important that all school projects receive the required inspections.

Inspections can be time- and labor-intensive. As a project is built, different sections of the building are often at different stages of construction and need different inspections. For example, one section may be ready for a footing and foundation inspection, while another section may be ready for a frame inspection. Although there are only eight different types of inspections, the same type of inspection may be performed multiple times during construction. Further, if violations are found during an inspection, industry practice requires a follow-up inspection to ensure the violations have been corrected before construction can continue. As a result, many more than eight inspections are typically required on most construction projects. According to our contractor, a large project, such as an assisted-living facility, which is similar to the size of a full-built school, may require more than 200 inspections. Although this number includes multiple partial inspections (i.e., where only certain parts of the building are inspected during each inspection) and follow-up inspections when violations are found, this number is significantly higher than the number of inspections conducted by the Division, which has typically been two—the boiler and final inspections. Additionally, according to Grand Junction, one of the local building departments to which the Division has delegated its authority to conduct plan reviews and inspections, in the past two years the school district has built 6 new schools and remodeled 24 schools. The new schools required a minimum of 50 to 70 inspections and the remodeled schools required a minimum of 24 inspections.

Construction is a season-dependent, deadline-driven process. Inspections need to be completed in a timely manner so that they do not interfere with the progress of construction. We contacted seven local building departments to determine how they handle their inspection workload. Several of the local governments we contacted have a phone number that building contractors call to schedule inspections, typically for the next day. Many of the larger building departments, including Denver, Aurora, and Grand Junction, have between 11 and 39 staff who only conduct inspections. These inspectors also conduct electrical and plumbing inspections that the Division does not perform. Also, several of the building departments we contacted, such as Centennial, use third-party inspectors to help meet their inspection workload. Some local governments, such as Grand Junction, use a combination of in-house inspectors and third-party inspectors to meet their inspection workload. As

discussed previously, the Division has one full-time staff person who conducts inspections statewide.

It is important that the Division ensure all buildings receive the required inspections to make certain schools are safe for those who occupy them. Children are considered a vulnerable population, and therefore, the State has even greater responsibility to ensure their safety and well-being. Also, schools that are not adequately inspected represent a potential liability to the State. If someone were injured because the school was not built in accordance with the building code, the State could be held liable for damages. Finally, inspections act as an incentive for contractors to build the school in compliance with the building code. Contractors who cut corners and are not caught because the Division is not conducting inspections receive an unfair advantage over contractors who spend their own resources to comply with the law and building standards.

The Division needs to determine the number of inspections that are required on all projects and use this information to assess the resources that will be needed to complete these inspections. To make this assessment, the Division needs to track all required inspections based on plan reviews, contractor requests for inspections, and inspections conducted. Historically, the Division has not tracked this information. The Division should track and use these data to determine the resources needed to conduct all required and necessary inspections and evaluate options for meeting its inspection requirements. These options are discussed in Recommendation No. 9.

Recommendation No. 5:

The Division of Oil and Public Safety should ensure that public schools receive all required building inspections prior to issuing a certificate of occupancy and allowing a school to be occupied. To determine its workload and the resources needed for completing all required inspections, the Division should track and analyze its past and current construction projects to estimate the number of inspections that need to be conducted, the time required to conduct those inspections, and requirements for follow-up. The Division should use this information when assessing options for addressing resource issues as discussed in Recommendation No. 9.

Division of Oil and Public Safety Response:

Agree. Implementation date: January 2008.

The Division will hire an experienced Public School Construction Program manager by July 1, 2007, to ensure that, beginning immediately, public

schools receive the final building inspection prior to issuing a certificate of occupancy and allowing a school to be occupied.

To determine its workload and the resources needed for completing all required inspections, the Division will track and analyze its past and current construction projects to estimate the number of inspections that need to be conducted, the time required to conduct those inspections, and requirements for follow up. The Division will use this information when assessing options for addressing resource issues as discussed in Recommendation No. 9.

Code Violations

As discussed previously, the Division is required to conduct various inspections throughout the construction phase of public school construction projects. During the audit, our contractor observed the Division's inspector as he conducted seven building inspections (two final inspections, one framing inspection, two fire penetration inspections, one gypsum board inspection, and one framing and mechanical inspection). One purpose of conducting these observations was to determine whether the Division is adequately identifying violations of the building code. Overall, our contractor found the Division is not consistently identifying all code violations during inspections.

Our contractor identified a total of 17 building code violations that the Division's inspector did not identify during the two final inspections that were conducted. For example, at the first school, a middle school, the exterior egress lighting and exit signs in the cafeteria were missing; a fire wall did not meet structural stability requirements; the auditorium and the stage within the auditorium were not wheelchair-accessible; and a locker room did not have the required benches. At the second school, an elementary school, exit signs in the cafeteria and library were missing; the storage room adjacent to the cafeteria did not have a self-closing door; and openings around the ducts in a laboratory were not adequately sealed to prevent the passage of smoke. This school also had a modular classroom that did not have the required number of exits; the exit signs that were in the classroom were not working; the required emergency lighting was missing inside and outside the classroom; the required landing at the bottom of the ramp was missing; and the ramp was not the width required by code. For the remaining five inspections, the Division correctly identified all code violations.

The problems our contractor identified with the Division's building inspection process are due to the inexperience of the staff person who is conducting these inspections. This staff member has been conducting inspections of public schools

for less than a year and has not received any formal training or certification to conduct building inspections. Prior to becoming a building inspector, this individual was working as a boiler inspector with the Division. According to our contractor, similar to plan reviews, learning to conduct inspections and apply the building code correctly requires a number of years of experience. In addition, our contractor has stated that certification from the International Code Council can help provide the necessary training for conducting inspections. As discussed previously, the International Code Council is the professional organization that develops most building codes, including the 2003 International Building Code. We contacted 13 local government building departments about their requirements for building inspectors and found that all 13 which includes Adams County, Aurora, Castle Rock, Fort Collins, Colorado Springs, Denver, Grand Junction, Greeley, Greenwood Village, Lakewood, Littleton, Longmont, and Pueblo require, as a prerequisite for being hired, that staff be certified by the International Code Council to conduct inspections. The Division should ensure that staff receive the training and experience necessary to effectively conduct inspections. This should include reviewing the training and certification programs offered by the International Code Council as well as training courses provided by private inspection agencies. Further, the Division should consider contracting for inspection expertise to supplement its internal staff resources as discussed further in Recommendation No. 9.

The Division should also develop and use standard checklists when conducting inspections. Although the Division currently has some checklists that can be used for inspections, the Division reports that it does not use them, since there are many different areas that need to be checked and potential violations that might be found during an inspection. However, checklists can help standardize the inspection process to ensure that all areas are sufficiently inspected, and they provide a useful tool and resource for newer staff to use when conducting inspections. Finally, the Division should review the exceptions identified by our contractor, determine which school districts need to be notified of any life-safety issues, and work with the districts to develop the appropriate remedies.

Recommendation No. 6:

The Division of Oil and Public Safety should improve its process for conducting inspections of public schools by ensuring staff have experience and are adequately trained and by developing standard checklists to use when conducting inspections. The Division should review the exceptions identified by our contractor related to life-safety issues and, as necessary, notify and work with the districts to develop the appropriate remedies.

Division of Oil and Public Safety Response:

Agree. Implementation date: January 2008.

The Division will hire an experienced Public School Construction Program manager by July 1, 2007, to oversee inspections. This position will develop and implement a training program for conducting inspections and develop and implement standard comprehensive checklists to ensure all issues are identified during inspections. The Division will review the life-safety issues identified for the schools in the audit sample and, as necessary, notify and work with the districts to develop the appropriate remedies.

Completeness of Inspections

In addition to not identifying all code violations, our contractor found that the Division did not always inspect all of the areas or items within a school that should have been inspected. For 4 of the 7 schools in our sample that were inspected by the Division, there were 16 areas or items that were never reviewed. Specifically, the Division's inspector did not inspect the following:

- At the first school, a high school, the inspection was of the framing and mechanical construction. The Division's inspector did not inspect a majority of the framing, the mechanical ducts for smoke dampers, and the exhaust duct construction in the kitchen.
- At the second school, a middle school, the inspection was a final inspection. The Division's inspector did not inspect several rooms for general construction and fire safety issues, such as emergency lighting and sprinkler systems; the rooftop construction, drainage, and mechanical vents; the building's compliance with energy efficiency requirements; or all mechanical units.
- At the third school, an elementary charter school, the inspection was a final inspection. The Division's inspector did not inspect emergency egress lighting; the rooftop construction, drainage, and mechanical vents; the building's compliance with energy efficiency requirements; or all mechanical units.
- At the fourth school, an elementary school, the inspection was of the gypsum board and fire-rated walls. The Division's inspector did not inspect several of the wall joints.

We identified four primary reasons why the Division did not inspect all of the required areas of these schools during the inspections. First, the Division's inspector was not able to access some parts of the building during the inspection because the schools were already occupied by students and staff or because the areas to be inspected were covered by snow. For example, at one of the schools that had already received a certificate of occupancy, even though the final inspection had not yet been conducted, there were students in the classrooms. Therefore, the Division's inspector did not enter the classrooms to check the sprinkler systems or the emergency egress lighting. In addition, at this same school and another school, the Division's inspector did not inspect the roofs' construction, drainage, and rooftop heating and air-conditioning systems because there was snow on the roofs. The Division's inspector did not note on the inspection reports for the schools that these items were not inspected. As a result, there is no record indicating what areas or items still need to be inspected.

Second, the Division's inspector was not able to inspect some areas in two of the schools because they had already been covered up by the next phase of construction. For example, the purpose of one of the inspections was to examine the frame for the building, which includes inspecting the size and bracing of the studs. However, about 70 percent of the building frame was covered in sheetrock at the time of the inspection. As a result, the Division was only able to inspect the portion of the frame that had not been covered. The building code requires that all parts remain exposed until they have been inspected and the contractor has been given the approval to proceed with construction. In addition, according to our contractor, industry practice often requires that construction materials be removed so that the areas underneath can be inspected.

Third, some areas were not inspected because the Division's inspector relied on the plan review to ensure code compliance. Specifically, during the final inspection at two of the schools the Division did not conduct inspections related to energy efficiency and, in particular, building insulation, lighting, and heating and air-conditioning systems, called HVAC systems. According to the Division, the architect is required to submit schedules to the Division during plan review showing the type of lighting and HVAC systems that will be installed and how the building complies with energy efficiency requirements. Since these items are supposed to be verified at the time of plan review, the Division's inspector believed that he did not need to inspect them in the field. However, as discussed previously, our contractor found that the Division is not consistently requiring architects to submit energy efficiency schedules with their plan reviews. As a result, the Division may never be reviewing and approving these schedules. Further, according to the building code, the Division is responsible for ensuring that the lighting and HVAC systems that are installed are the same as those shown on the schedules that were submitted to and approved by the Division. This includes ensuring the lighting has the correct energy

rating; the fixtures are properly sealed and insulated to prevent against heat loss; and the building, including doors and windows, has been properly insulated.

Finally, the Division's inspector did not inspect some areas in the schools because it was his understanding that other agencies are responsible for conducting these inspections. For example, the purpose of one inspection was to review the school's framing and mechanical systems and components. The Division did not check the mechanical ducts to determine whether they had smoke detectors. Our contractor inspected the ducts and found that smoke detectors had not yet been installed. According to the Division, checking the smoke detectors is the local fire department's responsibility, and therefore, it was not necessary for the Division to inspect for them. During the same inspection, our contractor found that the construction of an exhaust duct in a school kitchen was not complete. The Division did not check the exhaust duct. According to the Division, the local health department would be checking the installation of the exhaust duct to ensure it was properly installed. Although other agencies are responsible for certain inspections, according to the building code, the Division would be responsible for inspecting these specific items. In addition, the Division has never verified with these other agencies what they check during their inspections or consistently received copies of their inspection reports to ensure that all components of the building code are being covered by one of the agencies. Without knowing what other agencies actually check, the Division cannot be sure that all items have been properly inspected.

By not inspecting all areas of a construction project, the Division cannot ensure that public schools are safe for occupancy. Inspections are critical for ensuring that any code violations are identified before certain parts of the building are covered up. If there is a defect, once it is covered up there is no way of knowing that a problem exists. Defects related to fire-safety and emergency exiting could present a serious risk if a fire or some other emergency were to occur and students or staff could not safely exit the building. The Division needs to make several improvements to its process for conducting building inspections. The Division should work with school district contractors to ensure, to the degree possible, that all areas to be inspected are accessible and, if not, that a follow-up inspection is conducted. In addition, the Division should inspect schools to ensure that energy efficiency requirements are met and work with other agencies which conduct inspections to ensure that all areas and items receive an inspection. Any areas not inspected should be documented in the inspection report for future follow-up.

Recommendation No. 7:

The Division of Oil and Public Safety should ensure inspections are complete by:

- a. Working with the school district contractors to ensure that all areas to be inspected are accessible at the time of inspection and, if not, that a follow-up inspection is conducted.
- b. Inspecting buildings to ensure they comply with energy efficiency requirements.
- c. Working with the other inspection agencies to determine what areas are being inspected, identifying any gaps, and ensuring that an assigned agency is completing all required inspections.

Division of Oil and Public Safety Response:

Agree. Implementation date: October 2008.

As stated in Recommendation No. 5, the Division does not currently have the resources to perform all required inspections. To determine its workload and the resources needed for completing all required inspections, the Division will track and analyze its past and current construction projects to estimate the number of inspections that need to be conducted, the time required to conduct those inspections, and requirements for follow up. The Division will use this information when assessing options for addressing resource issues as discussed in Recommendation No. 9.

- a. & b. Upon completing an evaluation of our workload and the resources needed for completing all required inspections as well as pursuing any necessary legislative changes, the Division will work with school district contractors to ensure that all areas to be inspected are accessible at the time of inspection, and if not, that a follow-up inspection will be conducted and buildings will be inspected to ensure they comply with energy efficiency requirements. The implementation date assumes statutory changes by July 2008.
 - c. We will work with the other inspection agencies to determine what areas are being inspected, identify any gaps, and ensure that an assigned agency is completing all required inspections. This information will be integrated into the analysis performed in response to Recommendation No. 5. We expect to complete this analysis by January 2008.
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Documentation

As discussed previously, the Division is required by the statute (Sections 22-32-124(2)(a)(I) and 23-71-122(1)(v)(II)(A), C.R.S.) to review public school building plans and conduct inspections to ensure the buildings comply with the building and fire codes adopted by the Division. The first phase of this process is for the Division to conduct a preliminary review of the initial building plans and meet with the architect and school district officials to discuss concerns with the plans and changes that must be made to the plans to receive a building permit. The Division relies on the architect to document the results of the preliminary plan review meeting, including documenting any violations identified, and to submit those notes to the Division. The second phase of the process includes the Division's review of the final set of building plans and of all violations discussed during the preliminary review to ensure they have been corrected. Once the review phase is complete, the Division issues a permit authorizing the school to begin construction. During the construction phase the Division is required to complete various on-site inspections. Additionally, the Division is responsible for verifying that all required inspections are conducted by other agencies (e.g., Division of Fire Safety and Plumbing and Electrical Boards) and for maintaining these inspection reports in the Division's files for each project.

We reviewed the Division's records and found that, overall, the Division does not have a systematic method for documenting when plan reviews and inspections occur and when violations are noted. Specifically, we reviewed a sample of 20 projects (10 completed and 10 in progress) and found there was no documentation in the files related to either the preliminary or formal plan reviews for any of the projects. Additionally, we found none of the files for the 20 projects contained copies of the architect's notes from the plan review meetings with the Division. Therefore, we could not determine from the files whether the plan reviews occurred or if any violations were noted, and if so, whether they were corrected. In addition, we found no documentation to show what inspections the Division conducted and the results of those inspections (e.g., violations noted). Further, we found that when the Division conducts an inspection, it does not typically provide an inspection report to the contractor or the school showing that an inspection was conducted, what specifically was inspected, or any violations noted.

We also found the files for 5 of the 10 completed projects did not contain copies of the reports for inspections that were conducted by other agencies. Specifically, we found:

- One file did not contain copies of five required inspection reports (e.g., the plumbing and electrical reports from the State Plumbing and Electrical

Boards, reports from the local fire departments, and the health and sanitation report from the local health department).

- Two files did not contain copies of three inspection reports (e.g., the plumbing and electrical reports from the State Plumbing and Electrical Boards and reports from the local fire departments).
- Two files did not contain a copy of one inspection report (e.g., the plumbing and electrical reports from the State Plumbing and Electrical Boards or the health and sanitation report from the local health department).

According to the Division, it reviewed these inspection reports but did not retain copies for the files. We were able to obtain copies of the inspection reports from the State Plumbing and Electrical Boards for the three project files missing these reports.

Without documentation, we were unable to determine whether the plan reviews and inspections for these projects actually occurred and whether any issues or violations identified during the plan review and inspections were corrected prior to issuing a building permit or certificate of occupancy. According to the Division, by issuing a building permit or certificate of occupancy, the Division is attesting, by default, that all issues found during the plan reviews and inspections were resolved. However, as noted previously, we found instances in which the Division issued certificates of occupancy without completing the final inspection.

Documentation of plan reviews and inspections, including those performed by other state agencies, is critical for ensuring that all problems identified are corrected. Without documentation, reasonable assurances cannot be provided that public schools are free from defects and are safe for public occupancy. In addition, documentation serves as evidence of the Division's follow-through on the problems it finds and provides a means of ensuring that staff and the Division are held accountable for their responsibilities. Further, it is inappropriate for the Division to rely on notes taken by the architect during plan review meetings to verify that all issues found by the Division were corrected. Division plan reviewers and inspectors should be responsible for documenting their reviews and any issues identified, as well as providing copies of these reviews to the building contractor and owner after an inspection is completed. We contacted six local government building departments about their documentation practices and found that five departments (Castle Rock, Greeley, Greenwood Village, Lakewood, and Littleton) document their reviews and inspections and provide an inspection report to the building contractor or owner. The other building department, Thornton, also documents its reviews and inspections, but does not provide an inspection report to the building contractor or owner.

The Division should develop a systematic method for documenting plan reviews and inspections and for providing a copy of the inspection report to the school district contractor and the school facilities manager. The Division should consider using examples of inspection reports from other local government building departments to develop its own more comprehensive plan review and inspection reports. Additionally, the Division should maintain documentation of all inspections conducted by other state agencies and follow up with these agencies for the five projects in our sample to obtain copies of missing inspection reports. Finally, the Program manager should periodically review files to ensure they include all of the appropriate documentation.

Recommendation No. 8:

The Division of Oil and Public Safety should ensure plan reviews and inspections are adequately documented by:

- a. Developing a systematic method for documenting plan reviews and inspections, using examples from local building departments.
- b. Providing copies of inspection reports to the school district and building contractor.
- c. Ensuring copies of all inspections conducted by either the Division or other state agencies are maintained in the Division's files and periodically reviewing files to ensure they include all of the appropriate documentation. The Division should also follow up with agencies to obtain copies of missing inspection reports for the five projects in our sample.

Division of Oil and Public Safety Response:

Agree. Implementation date: January 2008.

The Division will hire an experienced Public School Construction Program manager by July 1, 2007, to ensure plan reviews and inspections are adequately documented by:

- a. Developing a systematic method for documenting plan reviews and inspections, using examples from local building departments.
- b. Providing copies of inspection reports to the school district and building contractor.

- c. Ensuring copies of all inspections conducted by either the Division or other state agencies are maintained in the Division's files and periodically reviewing files to ensure they include all of the appropriate documentation. The Division will follow up with agencies to obtain copies of missing inspection reports for the five projects in the audit.

Resources

As discussed throughout this chapter, our audit found that insufficient resources have contributed to the substantial problems we identified with the Division's Public School Construction Program. Currently the Division has only one staff person dedicated to conducting building plan reviews and one staff person dedicated to conducting inspections for about 150 construction projects submitted annually. These projects are located all across the State and range from small remodels to large additions to full-built schools.

According to the Division, its staff spend between 12 and 14 hours reviewing plans for a typical remodel or medium-size full-built school. In contrast, our contractor estimates that its staff would spend about 11 hours reviewing plans for a typical remodel project and 78 hours for a medium-size full-built school. Our contractor reports that additional time is required to ensure that the plans receive sufficient review and that all building code issues are identified and resolved.

Currently the Division lacks data tracking the size of projects and the hours required to conduct a thorough review of the building plans for its construction projects. Therefore, we are not able to determine the resources the Division would need to perform this function effectively. However, using our contractor's estimates, we roughly estimate that even if 90 percent of the Division's construction projects were small remodel projects and only 10 percent were full-built schools, the Division would need about 2,700 hours annually for conducting plan reviews. One employee working full-time can only spend about 1,800 hours annually on this function.

Similarly, the Division lacks data to track or estimate the resources needed to complete all required building inspections for approximately 150 construction projects annually. Our contractor estimates that for a large building, such as an assisted-living facility or a full-size school, about 200 building inspections performed throughout the various construction phases would typically be required. As discussed previously, the Division's building inspector has attempted to ensure that every public school construction project receives at least a boiler inspection and

final inspection. However, we found instances where the Division issued certificates of occupancy to public schools without conducting these final inspections.

The safety and soundness of taxpayer-funded school facilities is an important public concern. The Division should conduct a comprehensive evaluation of the resources needed to perform its statutory duties in an effective and efficient manner. As part of this, the Division should consider a range of options to ensure that sufficient oversight of public school construction projects occurs. Additionally, the Division will need to review its fee structure to ensure that fees are sufficient to cover the costs of the options selected. We discuss the Division's fees in the next section.

We contacted the Office of the State Architect within the State's Department of Personnel & Administration and 14 local government building departments (Adams County, Aurora, Castle Rock, Colorado Springs, Denver, Fort Collins, Grand Junction, Greeley, Greenwood Village, Lakewood, Littleton, Longmont, Pueblo, and Thornton), and other states (Arizona and Wyoming) to identify efficient options for improving the Division's oversight of public school construction projects. The first option the Division could consider is to contract with one or more qualified building plan review and inspection agencies to augment both the Division's resources and its expertise. The Office of the State Architect (Office), which is responsible for overseeing the construction of most state buildings (excluding public schools), has adopted this approach. According to the Office, contracting for these services allows the Office to complete inspections in a timely and efficient manner without expanding its FTE.

A second option available to the Division is to require schools to obtain plan reviews and inspections by an independent third-party inspector or plan reviewer and submit the plan reviews and inspection reports to the Division for its approval. The Division could develop a list of approved plan review and inspection agencies the school districts could use, along with requirements that these agencies must follow when conducting reviews and inspections. This option may require statutory authority.

A third option the Division could consider would be to delegate the responsibility for conducting plan reviews and inspections to local government building departments, to the extent possible. The statutes (Sections 22-32-124(2)(a)(I), and 23-71-122(1)(v)(II)(A), C.R.S.) already authorize the Division to delegate its responsibilities to local building departments if requested by the building department and approved by the Division and the school. The two other states we contacted (Arizona and Wyoming) use local building departments to conduct all or a portion of plan reviews and inspections for public schools. To ensure consistent application of the building code, the Division could develop delegation agreements with local governments that stipulate the building code to be applied for public school construction projects. The Division could work with local governments on the fees

that are charged for plan reviews and inspections. The Division has already delegated its authority to conduct plan reviews and inspections of public schools to three local governments (Aurora, Denver, and Grand Junction).

Fourth, the Division needs to consider whether a combination of these options would best serve the interest of the State. For example, with respect to plan reviews, the Division could delegate these reviews to local government building departments in the more populated areas of the State while using its own resources, in combination with contracted expertise, to conduct plan reviews for schools in remote parts of the State. This may be an appropriate option in instances where a small local government building department lacks sufficient resources to conduct these building plan reviews. With respect to inspections, the Division may wish to use its own resources, along with contracted expertise when necessary, to conduct all final inspections but contract with a private inspection company, or delegate the inspection function to the local government, to ensure that all other required and necessary inspections occur.

The Division's oversight of public school construction projects, as currently structured, provides insufficient assurance to the State and needs to be overhauled. The Division needs to work with the General Assembly to reevaluate the State's overarching interest and role in overseeing public school construction projects and seek statutory change, as appropriate. As mentioned previously, during Fiscal Year 2006 about \$10.9 million in state funds was spent on public school construction projects statewide, excluding those funded by locally issued bonds. Both state government and local school districts have an interest in ensuring these projects result in cost-efficient, safe construction to provide the best protection of our school children and the public.

Recommendation No. 9:

The Division of Oil and Public Safety should conduct a comprehensive evaluation of its resources and determine the resources needed to adequately conduct all plan reviews and inspections for public school construction projects. This should include working with the General Assembly to evaluate the State's role in overseeing public school construction projects and pursuing statutory change as necessary. This should also include considering options for ensuring that all required and necessary plan reviews and inspections occur. Among the options the Division should consider are:

- a. Contracting with a qualified third-party inspection agency to conduct plan reviews and building inspections.

- b. Requiring schools to obtain plan reviews and inspections from approved independent third-party contractors and submit them to the Division for review and approval. This option may require statutory authority.
- c. Delegating plan reviews and inspections to local building departments, where possible.

Division of Oil and Public Safety Response:

Agree. Implementation date: July 2008.

The Division will conduct a comprehensive evaluation of its resources and determine the resources needed to adequately conduct all plan reviews and inspections for public school construction projects. This will include working with the General Assembly to evaluate the State's role in overseeing public school construction projects and pursuing statutory change as necessary. This will also include considering options for ensuring that all required and necessary plan reviews and inspections occur. Among the options the Division will consider are:

- a. Contracting with a qualified third-party inspection agency to conduct plan reviews and building inspections.
- b. Requiring schools to obtain plan reviews and inspections from approved independent third-party contractors and submit them to the Division for review and approval. This option may require statutory authority.
- c. Delegating plan reviews and inspections to local building departments, where possible.

Fees

Regardless of the options the Division chooses for overseeing plan reviews and inspections for public school construction projects, the Division needs to ensure that fees are sufficient for covering the cost of the selected option(s). According to the statute (Sections 22-32-124(2)(b) and 23-71-122(1)(v)(VII), C.R.S.):

If the Division conducts the necessary inspection to determine that a building or structure . . . has been constructed in conformity with the building and fire codes adopted by the Director of the Division, the

Division shall charge a fee not to exceed two hundred dollars for such inspection. The Division shall charge a fee for plan review and issuance of a construction permit in an amount established by the Division by rule to cover the actual, reasonable, and necessary expenses of the Division.

In accordance with the statute, the Division developed and implemented a new fee schedule in December 2006. Fees are charged based on a sliding scale and increase as the cost of the project increases. We reviewed the Division's fee schedule for public school construction projects and identified two problems. First, we found the Division's fee schedule does not cover the costs associated with conducting all required inspections. As discussed previously, the Division is currently not conducting most of the inspections required on public school construction projects. If the Division were to conduct all required inspections, its costs, and thus, its fees, would increase.

The Division's fees are significantly less than what other local governments charge for plan reviews and inspections. We reviewed the fees charged by two local governments (i.e., Denver and Aurora) and found that these local governments also base their fees on the value of the construction project, similar to the Division. However, the fees charged by these local governments are generally higher than the Division's fees. For example, Denver and Aurora would charge a fee of about \$5,500 for a project valued at \$1 million, whereas the Division would charge about \$1,700. However, Denver and Aurora conduct significantly more inspections than the Division typically conducts.

We also reviewed fees charged by the Office of the State Architect (Office) within the Department of Personnel & Administration. As discussed previously, this Office oversees the construction of most state buildings and contracts with several consultants to conduct plan reviews and inspections on behalf of the State. The Office has established a fee schedule that all consultants must use. The fee schedule, which only covers the cost of plan reviews, is based on the value of the construction project. For inspection costs, the consultant is required to complete and submit to the Office a standard form detailing the estimated cost to complete the inspections, the consultant's hourly rate, the number of hours it anticipates the inspections will take, and mileage costs. The consultant must also submit its justification for each of these cost factors. Based on the Office's fee schedule, plan reviews for a project valued at \$1 million would cost about \$2,300. According to the Office's consultants, inspection fees can range from about \$1,900 for a small project to over \$13,000 for a large project. These fees are higher than the fees charged by the Division as well as Denver and Aurora. The difference in fees may be due to the fact that in addition to covering their costs, consultants are also concerned with earning a profit.

Second, we found that although the Division's fee schedule is similar to industry practice, it is not clear that the schedule is aligned with statute. More specifically, the statute requires a specific fee for each inspection and this amount is set in statute not to exceed \$200. The Division's sliding fee schedule charges a flat amount that covers both the plan review and all required inspections. As a result, there is not a separate inspection fee and there is no way to determine whether the Division is charging \$200 per inspection, as required by the statute. According to the Division, since its Attorney General approved the fee schedule it believed the fee schedule was aligned with statute.

The Division needs to reevaluate its fees to ensure they comply with the statute and are sufficient to cover the costs of the selected options for overseeing public school plan reviews and inspections, as discussed in Recommendation No. 9. Additionally, the Division should work with the General Assembly to propose statutory change to allow the Division to establish fees related to public school construction projects by rule. This would allow the Division to align its fees with industry practices and provide flexibility to adjust fees when necessary to cover program costs.

Recommendation No. 10:

The Division of Oil and Public Safety should reevaluate its fees to ensure they comply with the statute and sufficiently cover the costs of the option(s) the Division selects for overseeing public school construction projects, as discussed in Recommendation No. 9. The Division should also work with the General Assembly to amend the statute to allow the Division to establish all fees by rule.

Division of Oil and Public Safety Response:

Agree. Implementation date: July 2008.

The Division will reevaluate its fees to ensure they comply with the statute and sufficiently cover the costs of the option(s) the Division selects for overseeing public school construction projects, as discussed in Recommendation No. 9. The Division will work with the General Assembly to amend statute to allow the Division to establish all fees by rule.

Other Public Safety Functions

Chapter 2

Background

The mission of the Division of Oil and Public Safety's (Division's) Public Safety Program is to protect the public through effective registration, inspection, and enforcement of carnivals and amusement parks, explosives, and boilers. We reviewed the Division's practices with respect to each of these functions for all three program areas to determine if the Division is adequately protecting the public and ensuring that owner/operators of carnivals and amusement parks, explosives, and boilers are operating in compliance with the Division's statutes, rules, and regulations. We found that the Division needs to strengthen its oversight in each of these three areas, as discussed throughout this chapter.

Carnivals and Amusement Parks

The Division establishes standards related to the construction, repair, and maintenance of amusement rides and devices located at carnivals and amusement parks. A carnival is considered a temporary location, such as a county fair, where mechanical rides are operated. An amusement park is a permanent location that has mechanical rides. Amusement parks can include everything from large-scale parks with numerous amusement rides, such as Elitch Gardens, to small-scale parks with a small-gauge railroad, such as the Denver Zoo. The Division's regulations generally define an amusement ride as any mechanized device that carries passengers along a restricted course for amusement purposes. These include roller coasters, ferris wheels, small trains, and bungee jumping. Mechanical bull rides, self-propelled water rides, coin-operated devices, and other self-operated devices, such as playground equipment, are not regulated by the Division. All carnivals and amusement parks are required to register annually with the Division prior to operation.

Registration

Division regulations require all carnivals and amusement parks operating in Colorado to register annually with the Division prior to operation. To register, carnival and amusement park owners must submit an application to the Division that

includes, among other information, dates of operation in Colorado, a report of any injuries that have ever occurred at the facility in any state of operation that required medical treatment or resulted in death, copies of annual ride inspections, and a copy of the carnival's or park's liability insurance policy showing coverage if someone is injured on an amusement ride. After the Division approves the application, a permit is issued. The permit is valid for up to one year from the date of issuance. As of April 2006, there were 26 carnival and amusement park registrations on file with the Division. These registrations were approved by the Division between June 2004 and December 2005.

The Division reports that when a carnival's or amusement park's permit expires and is not renewed, the Division's practice is to send a letter to the owner notifying them that if they intend to operate in Colorado, the permit must first be renewed. If the Division finds that the carnival or amusement park is operating without a permit, the Division will issue a penalty notice. Statute allows the Division to assess penalties for noncompliance with registration requirements. According to the statute (Section 8-20-104(4), C.R.S.), the Division may "impose a civil penalty, depending on the severity of the alleged violation, not to exceed \$500 per violation for each day of violation; except that the Director may impose a civil penalty not to exceed \$1,000 per violation for each day of violation that results in, or may reasonably be expected to result in, serious bodily injury."

We reviewed carnivals and amusement parks operating in Colorado and found that some carnivals and amusement parks were operating with expired registrations and some had not registered with the Division at all. Specifically, we reviewed the Division's files for all 26 carnival and amusement park registrations that were on file with the Division as of April 2006. At the time of our review, we found 10 of the 26 carnivals and amusement parks had expired registrations. Of these 10, there were 3 amusement parks actively operating at the time their registration had expired. One of the three amusement parks was a large, well-known park that was operating during 2005 with an expired registration and did not renew its registration until 2006. Although one of the other two parks had submitted a registration application, the application was incomplete and the Division did not renew its permit. For these three amusement parks that were operating with expired registrations, the Division did not send follow-up letters requesting that the parks renew their permits or provide complete registration information, nor did the Division take enforcement action against the park owners. According to the Division, six of the remaining seven carnivals and parks were not operating at the time their registration expired and one was not required to be registered.

We also contacted a sample of 15 of the 55 county fair boards that had a carnival in 2005 to determine if these carnivals were registered with the Division at the time of operation. In general, each of the 15 county fair boards we contacted had one

carnival during the year. Of these 15 carnivals, 3 had never been registered with the Division and 2 had been registered with the Division in the past, but their registrations were expired in 2005 when they were operating. The Division was unaware of the three carnivals that had never been registered and, therefore, never sent a follow-up letter. For one of the two carnivals with an expired registration, the Division was not aware that the carnival was operating in Colorado and did not send a follow-up letter requesting that it renew its permit or assess a penalty. For the other carnival, its registration had expired in July 2004 and the Division never sent a follow-up letter requesting the carnival to renew its permit. However, in the summer of 2006 the Division found out that the carnival was operating in Colorado without a valid registration. Although the Division sent a penalty notice to the carnival, upon further review, the Division determined that further enforcement action was not necessary because the carnival had historically complied with regulations and the owner stated that he was unaware that the carnival's registration had expired and immediately registered with the Division. Finally, we conducted a Web search and identified at least four amusement parks that operate small-gauge railroads in Colorado and determined that none were registered with the Division. One of these amusement parks has been in operation for over 40 years and reported that it has never been registered with the Division.

Unregistered carnivals and amusement parks represent a risk to public safety because the owner may not be aware of or be in compliance with the Division's regulations. The Division relies on the registration process as a method to ensure that certain safety requirements are met. These requirements are intended to ensure that all mechanical rides are inspected annually by a qualified inspector, that the amusement park or carnival has adequate insurance in the case of an accident, and that all injuries that required medical treatment or resulted in death are reported.

Currently the Division relies on carnival and amusement park owners to initiate the registration process, which can be a problem if owners are not aware of the Division's registration requirements. The Division should identify ways to increase owner awareness. One approach may be to work with the county fair boards to increase their awareness of the Division and its registration requirements and request that the boards provide this information to carnivals operating in their counties. Of the 15 fair boards we contacted, 7 were not aware of the Division's registration requirements prior to our contacting them. The Division could also work with the fair boards to help identify any unregistered carnivals operating in their counties. Additionally, the Division should use resources, such as the Web, to identify amusement parks operating in Colorado that have not registered with the Division. The Division should also improve its follow-up and enforcement procedures when carnivals' and amusement parks' permits expire. This should include ensuring that letters are sent notifying the carnival or amusement park that its registration has

expired and taking enforcement action for noncompliance, particularly for repeat offenders.

Finally, the Division should consider amending its rules related to when carnivals and amusement parks need to register with the Division. Currently the Division's rules require carnivals and amusement parks to register annually, and the registration can occur any time during the year. This makes it more difficult for the Division to track registrations than the Division's previous rule, which required annual registration by April 1 for amusement parks and at least 30 days prior to operation for carnivals. Requiring all amusement parks to register annually by a specific date would help the Division better manage the registration process. For practical purposes, flexible due dates are needed for carnival registrations because carnivals are transient and may not know if they are going to be in Colorado until a month or two prior to operation. Therefore, the Division's previous rule requiring carnivals to register at least 30 days prior to the first day of operation in Colorado is a reasonable approach. This would provide the Division with sufficient time to review the application and follow up with the carnival to obtain any missing information. Further, the Division should consider making permits valid for only the specific dates of operation listed in the application. This would help the Division track when a carnival registration has expired and, thus, when the registration must be renewed.

Recommendation No. 11:

The Division of Oil and Public Safety should ensure that all carnivals and amusement parks operating in Colorado are registered with the Division by:

- a. Working with county fair boards to provide information about the Division's registration requirements and to identify unregistered carnivals. In addition, the Division should use resources, such as the Web, to identify unregistered amusement parks.
- b. Sending follow-up letters to carnivals and amusement parks when their permits expire and taking enforcement action when needed, particularly for carnivals and amusement parks that repeatedly operate without registering with the Division.
- c. Revising Division rules to require amusement parks to register annually by a specific date and carnivals to register at least 30 days prior to operation. The Division should also consider issuing permits to carnivals that are valid only for the specific dates of operation listed in the application, not for an entire year.

Division of Oil and Public Safety Response:

Agree. Implementation date: July 2008.

The Division of Oil and Public Safety will ensure that all carnivals and amusement parks operating in Colorado are registered by:

- a. Working with county fair boards to provide information about the Division's registration requirements and to identify unregistered carnivals. The Division will also use resources, such as the Web, to identify unregistered amusement parks.
- b. Continuing the effort to send follow-up letters to carnivals and amusement parks when their permits expire, and ensuring through management review, that the effort is comprehensive. The Division will take enforcement action when needed, particularly for carnivals and amusement parks that repeatedly operate without registering.
- c. Revising Division rules to require amusement parks to register annually by a specific date and carnivals to register at least 30 days prior to operation. The Division will also consider issuing permits to carnivals that are valid only for the specific dates of operation listed in the application, not for an entire year.

Permitting

The statute (Section 8-20-101(3), C.R.S.) requires the Division Director to “ascertain, fix and order such reasonable standards or rules for the construction, repair, and maintenance of carnivals and amusement parks and provide for annual registration fees, not to exceed one hundred dollars, and for the financial responsibilities of operators.” As discussed in the prior comment, Division regulations require carnivals and amusement parks operating in Colorado to register with the Division and to receive a permit prior to operation. To receive a permit, carnivals and amusement parks are required to pay a registration fee of \$100 and submit an application with required supporting documentation. According to the Division's regulations, the required documentation includes a report of any injuries that have ever occurred on one of the carnival's or park's rides in any state that required medical treatment or resulted in death, dates the carnival or park plans to operate in Colorado, the serial numbers of amusement rides owned and operated by the carnival or park, and annual inspection certificates for each amusement ride. A copy of the carnival's or park's insurance policy must be submitted directly by the

insurance company to the Division. The Division's regulations require carnivals and amusement parks to have insurance coverage of not less than \$100,000 for each accident on rides for children ages 12 and under with an annual aggregate of \$300,000 and \$1 million for each accident on all other rides.

The Division is required to review the application and approve permits only after verifying that all registration requirements have been met. According to Section 7 Part 1103.3 of the Colorado Code of Regulations, "upon receipt . . . the Director shall review the application and upon determining that the provisions of these regulations have been met, shall approve the application and register the carnival or amusement park."

We reviewed the Division's permitting process for carnivals and amusement parks and found the Division is approving permits without ensuring that all of the registration requirements have been met. Specifically, we reviewed the applications for all 26 carnival and amusement park registrations that were on file with the Division as of April 2006. We found 25 of the 26 applications were missing at least one piece of the required documentation, with some applications missing more than one item. For example, of the 26 applications:

- 12 did not provide insurance policies.
- 12 did not provide accident histories and 1 did not provide a complete accident history.
- 8 did not provide amusement ride inspection certificates for one or more of their rides.
- 3 provided incomplete or inaccurate serial numbers for their amusement rides.

The Division issued permits to all 26 carnival and amusement parks, and there was no evidence in the application files to indicate the Division followed up with the owners to obtain the missing documentation. We requested that the Division follow up with the 25 carnivals and amusement parks that failed to submit complete documentation to obtain the missing information. According to the Division, due to staff limitations, follow-up on the previous year's registrations was not feasible.

We also attempted to assess the completeness of the information provided by the carnivals and amusement parks on their registration applications related to their accident histories. Specifically, we reviewed a Web site that collects information on accidents involving carnival and amusement park rides and found that, based on the information reported on the Web site, accidents involving fatalities had occurred in other states at two of the carnivals registered with the Division. The Web site did not indicate whether amusement rides at the carnivals caused either of the accidents. As discussed previously, according to the Division's regulations, carnivals and

amusement parks must report accidents resulting in death or requiring medical treatment only if they were caused by the amusement ride. Neither of the carnivals reported these accidents to the Division in their registration applications.

The Division's registration requirements are designed to act as a safeguard to the public to help ensure that carnivals and amusement parks are operating safely by verifying that each ride has been inspected and that they have the required insurance coverage if an accident were to occur. The Division needs to make several improvements to its permitting process to ensure that documentation regarding all requirements is received and approved before a permit is issued. First, the Division should improve its tracking of the documentation it receives with registration applications by using a review template or checklist and document any missing information and follow-up actions taken. The Division should also ensure that the files for each carnival and amusement park contain all of the submitted documentation and that the files are organized chronologically by registration period.

Second, the Division should establish standard follow-up and enforcement procedures when carnivals and amusement parks do not submit the required documentation and do not comply with registration requirements. These procedures should include sending a formal letter requesting the missing information and pursuing enforcement actions for carnivals and amusement parks that operate without a valid permit. This documentation is an important part of ensuring the public's safety. For example, if an amusement park or carnival is operating without insurance and an injury occurs, the injured party would have limited ability to receive financial assistance.

Third, the Division should consider revising the section of the registration application that requests information on accident histories. One reason that some carnivals and amusement parks may not have provided their accident history is that the application is not clear as to how the applicant should respond. For example, the application does not ask whether any accidents occurred but merely asks that applicants attach a report of any injuries that occurred on an amusement ride in any state that required medical treatment or resulted in death. If an applicant does not attach a list of accidents, it is not clear if this is because no accidents occurred and there was nothing to report, or if accidents did occur but the applicant did not report them. It would be clearer if the Division provided space on the application itself for the applicant to attest to whether or not there were accidents with injuries that should be disclosed. The Division could then still require applicants to attach a list detailing the accidents. Finally, the Division should consider using a risk-based approach (e.g., selecting high-risk carnivals and amusement parks) for verifying the accident information reported on the applications through independent sources, such as Web sites, and taking enforcement action for failure to disclose complete information.

Recommendation No. 12:

The Division of Oil and Public Safety should ensure that permits are issued to only those carnivals and amusement parks satisfying the Division's registration requirements by:

- a. Improving the process for tracking documentation received with registration applications by using a review template or checklist and improving file organization so that missing information can be easily identified.
- b. Establishing formal follow up procedures for requesting missing documentation and taking enforcement action against those carnivals and amusement parks that do not provide complete information in accordance with the Division's registration requirements.
- c. Revising its application to require that carnivals and amusement parks attest to whether they had any accidents, checking the accuracy and completeness of reported accident histories through independent sources, using a risk-based approach to follow up and independently verify accident histories when indicated, and taking enforcement action for failure to disclose all accidents.

Division of Oil and Public Safety Response:

Agree. Implementation date: July 2008.

- a. The Division will implement the checklist it has developed to improve the process for tracking documentation received with registration applications and will continue to improve file organization so that missing information can be easily identified.
- b. The Division will establish formal follow-up procedures for requesting missing documentation and taking enforcement action against those carnivals and amusement parks that do not provide complete information in accordance with the Division's registration requirements.
- c. The Division will implement its revised application that requires carnivals and amusement parks to attest to whether they had any accidents, and will use a risk-based approach to check the accuracy and completeness of reported accident histories through independent sources, to follow up and independently verify accident histories

when indicated, and take enforcement action for failure to disclose all accidents.

Daily Inspections

The Division has established health and safety standards that govern operations of carnivals and amusement parks. The Division has generally adopted the standards developed by the American Society for Testing and Materials, which sets standards related to the design, manufacture, testing, operation, maintenance, inspection, and quality assurance of amusement rides and devices. The Division's standards, which are set in the Colorado Code of Regulations (7 CCR 1102), require, "In addition to the annual inspection . . . the owner/operator who operates a mobile amusement ride must perform and record daily inspections of the mobile amusement ride" Section 1102 of the CCR also requires, "Records of the daily inspections must be available for inspection [by the Division] at the location at which the amusement ride is operated, and the records must be maintained with the amusement ride for a period of one year." According to the CCR, the daily inspection record must include an inspection of passenger restraints, automatic and manual safety devices, tightness of bolts and nuts, lubrication of moving parts, and hydraulic equipment. Prior to opening the ride, the operator must allow the ride to go through one complete cycle to ensure proper functioning. Section 1105 of the CCR also requires that if a carnival or amusement park fails to meet the standards set forth in the CCR, the Division is required to give notice of the violation and order that the violation be corrected. Depending on the severity of the alleged violation, the Division is authorized pursuant to statute (Section 8-20-104(4), C.R.S.) to impose a penalty of up to \$1,000 per violation per day.

We reviewed the Division's monitoring of carnival and amusement park inspections and found that the Division cannot ensure that all carnivals and parks are complying with regulations and conducting daily inspections of their mechanical rides. We visited five amusement parks with the Division between February and May 2006 to review their operations, including their record-keeping and maintenance practices. Prior to our audit, the Division had never conducted any inspections of amusement parks or carnivals. We found four of the five parks did not have a record of their daily inspections. Two of the four parks that did not have a record of their daily inspections were not yet open for the season and two were open to the public and operating. For the two parks that were operating, both reported that they conduct daily inspections, but they do not record them. According to the owner at one of the parks which opened for the first time in December 2005 and had only been operating for a few months at the time of our site visit, he was not aware of the Division's requirement to maintain a record of daily inspections. For the two parks that were

not yet open, one reported that it kept records of the daily inspections, but the records were maintained at their main offices located in another state. The other park reported that daily inspections are conducted, but it does not keep a record of them. The Division verbally notified the four amusement parks during the site visit that they should be keeping a record of their daily inspections on-site; however, the Division did not take enforcement action and has not conducted a follow-up since our site visit to ensure that daily inspections are now being recorded.

Daily inspections are important for ensuring that mechanical rides are operating safely. The Division should consider options for improving its oversight of carnivals and amusement parks to help ensure compliance with Division regulations and specifically, the daily inspection requirement. One option would be to conduct periodic site visits and review carnival and amusement park daily inspection records. According to the Division, on-site inspections have not been feasible because it has only 0.3 FTE (equivalent to one employee working full-time for a four-month period during one year) allocated to its Carnival and Amusement Park Program. The Division reported that most of its time is spent reviewing applications, developing policies, and conducting general program oversight. The Division estimates that staff spend about a month processing the annual carnival and amusement park applications and conducting some follow-up. The Division recognizes that some of the remaining time could be spent on other oversight activities, such as on-site inspections. It may not be reasonable or necessary for the Division to visit every site. The Division could implement a risk-based approach to selecting carnivals and amusement parks to visit. For example, carnivals that are continually moving from one location to another, have a history of accidents, or newer facilities may represent a higher risk than large, well-established amusement parks that generally have full-time staff dedicated to conducting inspections.

Another option would be to have carnival and amusement park operators attest on their application forms that they understand they are required to maintain daily inspection records and to produce them upon request, and if such records are not available at the time of inspection upon request, the operator may be fined up to \$1,000 for each day of violation. The Division could then periodically request the carnivals and amusement parks to submit copies of daily inspections for a selected period. The Division could perform a desk review to determine if the carnivals and parks are keeping adequate records of their daily inspections. Finally, the Division should take enforcement action, such as assessing penalties, against carnivals and amusement parks that do not comply with the Division's regulations for performing and recording daily inspections.

Recommendation No. 13:

The Division of Oil and Public Safety should improve its monitoring of carnivals and amusement parks to ensure the carnivals and parks conduct daily inspections of amusement rides and maintain records of these inspections. More specifically, the Division should:

- a. Conduct periodic on-site reviews of inspection records, using a risk-based approach to determine which carnivals and amusement parks to visit or have carnival operators attest on their application forms that they maintain daily inspection records. The Division could then periodically request that carnivals and amusement parks submit copies of daily inspection records for a desk review.
- b. Taking enforcement action against carnivals and amusement parks that do not comply with the Division's inspection and record-keeping requirements.

Division of Oil and Public Safety Response:

Agree. Implementation date: January 2008.

- a. The Division will evaluate whether to perform periodic onsite reviews of inspection records using a risk-based approach or to have carnival and amusement park operators attest on their application forms that they maintain daily inspection records and periodically request that copies be submitted for a desk review. Following the evaluation, the selected process will be implemented.
- b. The Division will take enforcement action against carnivals and amusement parks that do not comply with inspection and record-keeping requirements.

Inspector Qualifications

In addition to daily inspections, the Division requires annual inspections of carnival and amusement park rides. Each ride must be inspected to test the stress and wear-related damage of critical parts. According to the Colorado Code of Regulations (7 CCR 1101), these annual inspections must be conducted by an inspector who is "a person qualified by training, education, or experience to conduct safety inspections of amusement rides or devices on behalf of an insurance company and

in accordance with the American Society for Testing and Materials standards, the manufacturer's standards and criteria, or standards established by the insurance company." The Division's general practice is to accept inspections conducted by an insurance company or a private inspector. Regulations also require that inspection certificates be submitted to the Division only after all discrepancies have been resolved and all necessary repairs and replacements have been made.

We reviewed the Division's processes for ensuring that only qualified inspectors conduct inspections of amusement rides and identified two main problems. First, we found the Division has not established minimum requirements for training, education, or experience for inspectors, and has not required that inspectors provide their qualifications to the Division. To determine whether inspectors had some level of training, education, or experience to perform inspections of amusement rides, we requested the Division obtain inspector credentials. The Division requested credentials from all 16 inspectors (13 private inspectors and 3 insurance company inspectors) that inspected rides for the 27 carnivals and amusement parks that had active registrations as of June 2006. Only 6 inspectors provided their credentials to the Division; the remaining 10 did not respond. We reviewed the credentials for the six inspectors who responded and found all of the inspectors had some level of training, education, or experience related to safety inspections. However, since the Division has not established minimum requirements related to qualifications, we were not able to determine whether the inspectors were sufficiently qualified. For the 10 inspectors who did not respond, we were unable to determine if these inspectors had any amount of training, education, or experience related to safety inspections or whether these inspectors were qualified to inspect rides.

Second, we found that inspections are not always conducted by an independent inspector. Specifically, we found one case where the inspector was also the ride owner and designer. The Division accepted the certificate of inspection because the Division's regulations do not specify that the owner operator cannot perform its own inspection if it is qualified to do so. An annual inspection conducted by the owner of an amusement ride represents a conflict of interest because the owner may have an incentive to allow the ride to pass inspection even when the ride is not functioning properly. One of the functions fulfilled by independent, third-party inspectors is an objective assessment of the safety of amusement rides.

The purpose of an annual inspection is to test for more serious defects that could cause serious injuries and to ensure that rides are operating in accordance with safety standards set by the ride manufacturer. By not establishing specific minimum qualifications for ride inspectors and verifying that inspectors meet these standards, the Division cannot ensure that inspections are performed by qualified inspectors.

The Division needs to establish minimum qualifications for amusement ride inspectors. This could include requiring inspectors to have certain certifications, such as a certification from the National Association of Amusement Ride Safety Officials (NAARSO). NAARSO provides training and various levels of certification to ride inspectors. Other states, such as Maine, Massachusetts, New Jersey, and North Carolina, require their ride inspectors to be NAARSO-certified. The Division should also consider requiring that carnivals and amusement parks obtain qualifications from their annual inspector and submit those along with their annual registration application. The Division could use this information to ensure inspectors are appropriately qualified and to verify credentials. The Division could also use this information to establish a database with inspector qualifications that would only need to be updated if a carnival or amusement park changed inspectors. Additionally, the Division should consider revising its regulations to require that annual inspections be conducted by an independent third-party inspector. The Division should pursue the statutory authority, as necessary, to implement these changes.

Recommendation No. 14:

The Division of Oil and Public Safety should ensure that inspectors are adequately qualified to perform inspections of amusement rides by establishing minimum standards for inspector training, education, and, experience. Additionally, the Division should consider options for ensuring that inspectors meet these minimum standards, pursuing statutory change as necessary. Options may include:

- a. Requiring carnivals and amusement parks to obtain and submit their inspector's qualifications as part of the annual registration application. The Division could then verify these qualifications and develop a database of approved inspectors.
- b. Revising regulations to require that annual inspections be conducted by an independent third-party inspector.

Division of Oil and Public Safety Response:

Agree. Implementation date: July 2008.

As part of the overall evaluation of the program as identified in Recommendation No. 15, the Division will analyze methods of ensuring that inspectors are adequately qualified to perform inspections of amusement rides. A key component of this evaluation will be establishing minimum standards for inspector training, education, and experience. During the study

the Division will consider options for ensuring that inspectors meet these minimum standards, and pursue statutory change as necessary. Options may include:

- a. Requiring carnivals and amusement parks to obtain and submit their inspector's qualifications as part of the annual registration application. The Division could then verify these qualifications and develop a database of approved inspectors.
- b. Revising regulations to require that annual inspections be conducted by an independent third-party inspector.

Oversight

As discussed throughout this chapter, the Division has been given the statutory authority to oversee carnivals and amusement parks operating in Colorado. The Division's authority was established in 2001 through the following statutory requirement:

The Director of the Division of Oil and Public Safety shall ascertain, fix, and order such reasonable standards or rules for the construction, repair, and maintenance of carnivals and amusement parks and provide for annual registration fees, not to exceed one hundred dollars, and for the financial responsibilities of operators. (Section 8-20-101(3), C.R.S.)

In response to this statutory mandate, the Division established regulations related to carnivals and amusement parks. These regulations (1) define the types of carnivals and amusement parks operating in Colorado that are subject to the Division's oversight; (2) require carnivals and parks to register annually and provide proof of liability insurance; (3) require daily and annual ride inspections; and (4) authorize the Division to take enforcement actions, including assessing fines, against carnival and park owners who fail to comply with Division regulations.

Our review of the Division's Carnival and Amusement Park Program indicates that although the Division has promulgated regulations as mandated by the statute, the Division needs to improve its oversight of the Program to ensure compliance with those regulations. As discussed previously in this chapter, the Division does not follow up with carnival or park owners when they fail to provide all requested information before issuing a permit, and therefore, the permitting process does not effectively ensure the financial responsibility of owners and the safety of rides.

Furthermore, the Division has not established a process to ensure ride inspectors are qualified, and prior to our audit, the Division had never performed on-site inspections to ensure carnivals and amusement parks were conducting and recording daily inspections of amusement rides. Finally, the Division performs limited enforcement activity related to carnivals and amusement parks. The Division does not have a process to identify unregistered carnivals and parks and does not typically assess fines or penalties for violations. Overall, the Division's current process does not provide adequate assurance that carnivals and amusement parks are consistently operating in accordance with the Division's regulations and that the health and safety of individuals who ride the mechanical devices are adequately protected.

Currently the Division has 0.3 FTE assigned to regulating the carnival and amusement park industry, and this individual's activities have been primarily focused on application review and permitting. According to the Division, these resources are not sufficient to support an effective program for monitoring and enforcing Division regulations related to carnivals and parks. The Division also points out that the statute does not specifically address the Division's role related to the oversight and enforcement of these regulations, and consequently, the Division has not developed a comprehensive monitoring and enforcement program. According to the Division, when an accident occurs on an amusement ride, the Division is engulfed with questions and concerns from the media regarding the Division's role in ensuring rides are operating safely. Overall, there appears to be a gap between public expectations in terms of state oversight and the resources the Division has available to provide effective oversight.

We question how much value the Carnival and Amusement Park Program, as it is currently structured, is providing to the State. Either the Division should structure an efficient and effective program for overseeing and enforcing its regulations, and seek statutory clarification and funding, as appropriate, or the Division should work with the General Assembly to eliminate the Division's responsibility for regulating carnivals and amusement parks.

One option to consider is for the Division to seek statutory clarification and funding to develop an effective program for monitoring and enforcing carnival and amusement park regulations. More specifically, this could include conducting annual inspections, investigating accidents, identifying unregistered carnivals and parks, and performing additional outreach to local fair boards. For example, the Division reports that it is interested in requiring carnivals and amusement parks to post their permits in conspicuous locations, along with Division phone numbers, so that the public can call the Division to report incidents or concerns. Furthermore, the Division would like to be more involved in investigating accidents and identifying appropriate remedies to better protect the public's health and safety. To implement an investigation program, the Division would need to acquire staff and trained

expertise. Additionally, the Division would need to revise its rules to require that carnivals and amusement parks provide the Division with notice of accidents within 24 hours instead of annually, as currently required by the Division's registration process.

We contacted 10 states (Arizona, Maine, Massachusetts, Michigan, Montana, New Hampshire, New Jersey, North Carolina, Ohio, and Wyoming) to determine whether these states regulated carnivals and amusement parks. We found that 7 of the 10 states (Maine, Massachusetts, Michigan, New Hampshire, New Jersey, North Carolina, and Ohio) regulate carnival and amusement park operations by requiring registration with the state and proof of insurance, similar to Colorado. However, these seven states also perform additional oversight activities. For example, all seven states employ state inspectors who conduct safety inspections of amusement rides and investigate ride accidents. Five of the states also regularly conduct on-site reviews of carnival and amusement park records (e.g., daily inspection, maintenance, and accident records). All seven states require specialized training for their inspectors, such as a training offered by the National Association of Amusement Ride Safety Officials (NAARSO).

Alternatively, the Division's responsibility for regulating carnivals and amusement parks could be eliminated. We identified three states, Arizona, Wyoming, and Montana, that do not regulate carnivals and amusement parks. These states rely either on the local governments to regulate carnivals and parks or on the carnivals and parks to regulate themselves. According to the insurance industry and ride inspectors, factors such as the risk of financial loss, or the consequences of legal action due to negligence, encourage self-regulation in the carnival and amusement park industry. Colorado could adopt a similar approach. Eliminating the 0.3 FTE responsible for regulating carnivals and amusement parks would save about \$15,000 per year.

The Division should work with the General Assembly to determine the role the State should play in regulating carnivals and amusement parks. As discussed previously, options range from implementing a more comprehensive monitoring and enforcement program to eliminating the function. Depending on the option selected, the Division should pursue statutory changes and amend its regulations as indicated. Regardless of the policy decision, statutes should clearly define the level of oversight and monitoring to be performed by the Division when registering a carnival or amusement park, including the level of assurance that state registration provides to the public.

Recommendation No. 15:

The Division of Oil and Public Safety should work with the General Assembly to determine the State's role in overseeing carnivals and amusement parks. This should include evaluating whether the Carnival and Amusement Park Program should be improved by implementing a more comprehensive monitoring and enforcement function or whether the Program should be eliminated. Depending on the direction taken, the Division should seek statutory change, as appropriate.

Division of Oil and Public Safety Response:

Agree. Implementation date: July 2008.

The Division will work with the General Assembly to determine the State's role in overseeing carnivals and amusement parks. The evaluation will include the analysis performed in Recommendation No. 14 concerning inspections, a more comprehensive monitoring program, and the development of an enforcement program. The Division will seek statutory changes based upon the outcome of the evaluation.

Explosives

According to the statute (Section 9-7-105, C.R.S.), the Division is responsible for establishing rules and regulations related to explosives to help ensure the safety of workers, the public, and the protection of property. The Division regulates individuals or businesses that use, manufacture, possess, sell, store, transport, or dispose of explosives or blasting agents. These include individuals who use explosives for research and development, such as contractors producing components used for military explosives, highway and building construction and demolition, and oil and gas exploration. The Division does not regulate explosives used for military purposes, emergency operations of any government law enforcement agency, or mining and agricultural purposes. The Division also does not regulate fireworks, model rockets, or ammunition for guns, such as rifles and pistols.

The statute (Section 9-7-104(1)(a), C.R.S.) also requires the Division to "issue permits [for explosives] to applicants found by the Division, after inspection and investigation, to be qualified for such permit under the provisions of this article and the rules and regulations of the Division." In response to this mandate, the Division has implemented three different types of permits. The first is called a Type I permit, which is issued to individuals who use, transport, have access to, or possess and

control explosives. To receive a Type I permit, in general, applicants must have at least one year of experience with explosive materials, take an explosives exam for their initial permit and score at least 90 percent, and pass a criminal history check. For permit renewals applicants must either take the exam again or provide proof of having received 16 hours of continuing education in explosives.

The second permit is called a Type II permit, which is issued to entities or individual business owners that manufacture, sell, purchase, transport, use, or dispose of explosives. To receive a Type II permit, all individuals involved in the business, including owners, partners, or managers who have access to explosives and are responsible for compliance, and employees who use or have access to explosives must have a Type I permit or be in the process of applying for a Type I permit. The third permit is called a Type III permit, which is issued to entities or individuals that store explosives and have an approved storage magazine site. A magazine is a structure used to store explosives and can be the size of a small box or an actual building. The Division is required by the statute (Section 9-7-104(1)(a) and (c), C.R.S.) to conduct an inspection of the storage magazine and site prior to permit approval and renewal. The purpose of the inspection is to ensure magazines are adequately secured from theft and fire hazards. All three types of permits cost \$75 each and must be renewed every three years. As of July 2006, the Division reports that it had 1,243 active Type I permittees, 233 active Type II permittees, and 244 active Type III permittees.

We reviewed the Division's oversight of explosives and the individuals and businesses who use, manufacture, possess, sell, store, transport, or dispose of explosives and found that, overall, the Division needs to reevaluate the best way for the State to regulate these entities. Specifically, we found that some of the Division's permitting and inspection functions are duplicating functions currently performed by the Federal Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATFE) within the United States Department of Justice. Further, we found that for some of the areas where duplication exists, the ATFE may be providing more comprehensive oversight than the Division. These issues are discussed in more detail below.

Duplication

The ATFE is responsible for regulating businesses that use, manufacture, sell, deal, and transport explosives, as well as businesses that store explosives. The ATFE issues a separate license or permit (similar to the Division's Type II permit) for each of the different functions described above, with the exception of storing explosives. Businesses that manufacture, sell, deal, or transport explosive materials must have a separate *license* from the ATFE for each of these functions (e.g., manufacturing, selling, etc.). Businesses that actually use explosives for blasting purposes must

receive a separate *permit* from the ATFE for that purpose. A license or permit, whichever is applicable, is issued to the “responsible persons” at a business. “Responsible persons” are individuals who have the power to direct the management and policies as they pertain to explosives. The ATFE does not issue a separate license or permit to individual users (similar to the Division’s Type I permit) or entities that store explosives (similar to the Division’s Type III permit). The ATFE assumes that entities that store explosives will also be involved in one of the other functions described above requiring a permit.

As part of the licensing and permitting process, the ATFE conducts criminal history checks on all business employees who have actual physical possession or control of explosives, or who blast explosives. If the business also stores explosives, the ATFE is required to conduct an on-site inspection to ensure compliance with federal regulations related to safe magazine construction and storage practices, although the ATFE does not issue a separate license or permit for that purpose. These inspections are required prior to approving the business to be licensed or permitted and at least every three years thereafter. According to ATFE staff, inspections are actually conducted on an annual basis. The cost of an ATFE permit or license ranges from \$25 to \$200 depending on the type of permit or license issued. Some entities may have multiple permits or licenses depending on their business involvement with explosives. Permits and licenses are valid for different lengths of time depending on their type; however, most are valid for three years. As of April 2006, the ATFE reports that it had about 190 active permittees and 120 active licensees in Colorado. We compared the ATFE’s list of Colorado permittees and licensees with the Division’s list and identified some permittees and licensees that were not registered with the Division. We contacted a sample of these permittees and licensees and found they were involved with explosive activities (e.g., fireworks) the Division does not regulate; therefore, they were not under the Division’s purview.

We reviewed the Division’s and the ATFE’s activities related to permitting and licensing entities involved with explosives and found several areas where duplication exists. For example, as discussed above, both the Division and the ATFE:

- Establish regulations related to the use, manufacture, purchase, possession, sale, storage, transportation, and disposal of explosive materials in the State of Colorado.
- Issue permits or licenses to businesses involved in explosives (i.e., Type II permittees). Also, both the ATFE and the Division conduct criminal history checks on all individuals or employees who use or handle explosives (i.e., Type I permittees). Both the Division and the ATFE generally conduct name-based criminal history checks using information from the National

Criminal Information Center, the Colorado Criminal Information Center, local authorities, and court records.

- Conduct routine inspections of storage magazines (i.e., Type III permittees), including reviewing inventory and blast records and visually inspecting the location and construction of the magazine.

Duplication does not exist between the ATFE and the Division with respect to permitting individual explosive users. Unlike the ATFE, the Division requires that each individual who uses or handles explosives have a permit. As discussed previously, to receive a permit, applicants must show proof of experience with explosives, pass an exam that is issued by the Division or provide proof of continuing explosives education for permit renewal, and pass a criminal history check. The only part of the process that is duplicated by the ATFE is the criminal history check. According to the ATFE staff and two of the entities we visited during our site visits with the Division's inspector, the Division's user permits provide added protection to ensure that users are adequately trained in using explosives.

Oversight

While there is some overlap between the Division's and the ATFE's oversight responsibilities with respect to explosives, we found several areas where the ATFE may be providing more comprehensive and timely oversight than the Division. For example:

Timeliness of Inspections. As discussed above, the Division is statutorily required to inspect magazines prior to issuing the initial permit, and the Division's regulations require an inspection prior to permit renewal, or every three years. We reviewed a sample of 52 Type III permits issued by the Division to magazine owners between August 2000 and November 2005. These 52 permittees owned a total of at least 161 magazines. We found that none of the 161 magazines were inspected prior to the Division's issuing the initial permit. In addition, as of the date of our review, 38 permittees had renewed their permits, while the remaining 14 permittees were not yet due for renewal. For the 38 permits that were renewed, 12 permittees owning a total of 33 magazines had not been inspected prior to permit renewal. As noted previously, the ATFE also conducts magazine inspections prior to approving permits or licenses. The ATFE reports that these magazines are usually inspected once per year, although they are only required to be inspected every three years. According to the ATFE, its inspections are up to date.

Comprehensiveness of Inspections. A typical inspection involves a visual inspection of the magazine's construction, including the hinges, locks, hoods, ventilation, and compliance with location and site requirements. Inspections also

include a review of explosive inventory records kept on-site in the magazine to ensure that inventory is tracked on an approved form and the inspector's independent count of the explosives in the magazine matches the owner's records. We observed the Division conduct six magazine inspections and the ATFE conduct one inspection. On the basis of our observations, we found that the ATFE's inspection appeared to be more thorough than the Division's. Specifically, we found the ATFE inspector counted all of the explosive inventory in the magazine and verified this count against the owner's blast and purchasing records and discussed the applicable regulations with the magazine owner. Conversely, we observed that the Division's inspector did not verify all of the inventory in the magazines or systematically discuss regulations with the magazine owner.

Follow-Up on Violations. When violations are found during magazine inspections, the Division's inspector prepares a violation report and provides a copy to the magazine owner. The report contains a section for the inspector to list the violations found, a deadline for correction, and a place for the owner's signature to certify that the owner received a copy of the violation report. The Division's inspector has the discretion to set the deadline for correcting any violations noted on the report. As discussed previously, we reviewed the inspections conducted by the Division for a sample of 52 magazine permittees. These 52 permittees owned a total of at least 161 magazines; some permittees owned only one magazine, while others owned multiple magazines. Between February 2003 and November 2005, the Division conducted a total of 73 inspections of these 161 magazines. Some magazines had no inspections during this period while others had up to three. The Division's inspector noted a total of 69 violations, or problems, during 38 of the 73 inspections. We found that none of the 69 violations were listed in the violation notice section on the inspection form. As a result, the owners were not provided written notice of the violations or provided a deadline for correcting the violations. These violations included insufficient bullet proofing, improper locks, inadequate fire prevention, and missing blast reports and inventory lists. We also found that even when the Division identifies violations and lists them in the violation notice section on the inspection form, it has not established standard deadlines for correcting violations or for requiring magazine owners to submit documentation to show that the violations were corrected. Additionally, at the time of our audit, the Division did not generally conduct any follow-up inspections to verify that violations have been corrected. Conversely, based on our review of the ATFE's inspection report issued during the inspection we observed, the ATFE has a very detailed inspection report that lists all violations found during an inspection and reports that it will conduct follow-up inspections depending on the type of violation to verify that the problem has been corrected.

Enforcement Authority. The statute (Section 9-7-104(1)(b), C.R.S.) allows the Division to deny, suspend, or revoke a magazine owner's permit if the owner does

not correct violations identified during an inspection. Additionally, the statute (Section 9-7-111 C.R.S.) allows the Division to pursue criminal charges for failure to obtain the required explosives permit from the Division. Currently the Division lacks the authority to issue a penalty, or fine, to a magazine owner for not correcting less serious violations in a timely manner or for failing to obtain the required explosives permit from the Division. Conversely, the ATFE, which is a law enforcement agency, has criminal enforcement authority and can prosecute a licensee or permittee who fails to report thefts of explosives within 24 hours. The ATFE also has the authority to issue penalties or fines for violations that are not corrected.

Staff Resources. Currently the Division has allocated about 0.2 of the 0.7 FTE appropriated to its Explosive Program to conducting magazine inspections and does not have specific training requirements for its inspector. Conversely, the ATFE has 11 investigators who conduct magazine inspections in five states, including Colorado. This is about two investigators per state compared with the 0.2 FTE allocated by the Division to conduct inspections. Additionally, the ATFE inspectors are required to complete an eight-week training course, of which about 50 hours are spent on explosives training.

Prior to November 2002, the Division was the only governmental organization regulating explosives, excluding explosives used for mining purposes, in Colorado, including issuing permits and conducting routine magazine inspections. At that time, the ATFE only regulated individuals or entities involved in interstate activities related to explosives. However, in November 2002 the United States Congress passed the Safe Explosives Act, which expanded the ATFE's authority over entities involved with explosives. The purpose of this Act, passed in response to homeland security concerns, was to strengthen licensing and permitting requirements and restrict the availability of explosives to felons and other persons prohibited from possessing explosives. With the passage of the Safe Explosives Act, the ATFE began duplicating some of the duties conducted by the Division.

The Division states in its regulations that the purpose of its explosives program is to ease the burden on permit holders, to better incorporate numerous requirements from other government agencies, and to provide uniformity of compliance and elimination of numerous areas of confusion and duplication. Due to the change in the role of the federal government in regulating explosives, the Division's statutory mandate and procedures are no longer aligned with this goal. The Division reports that it currently spends about \$45,000 annually to operate its explosives program. This includes about \$10,000 for the same criminal history checks completed by the ATFE. In addition, permittees must pay up to \$200 or more every three years for explosives permits and licenses—\$75 to the Division and at least \$50 to the ATFE for a permit and \$100 to the ATFE for a license. Eliminating or reducing duplication could help save the State and permittees time and money. Eliminating the Division's permitting

requirement for its 233 Type II permittees and 244 Type III permittees would save these entities almost \$36,000 every three years.

Other state agencies have streamlined their regulatory operations in response to the passage of the Safe Explosives Act. For example, the Office of Active and Inactive Mines, now called the Division of Reclamation of Mining and Safety (DRMS), in the Department of Natural Resources, issued permits for explosive use and storage related to mines and conducted explosive inspections prior to June 2003. Once the Safe Explosives Act passed, the ATFE began issuing permits for explosives used for mining purposes. In response, the General Assembly determined that some components of DRMS's explosives permitting system were duplicative with the ATFE and eliminated the overlapping activities related to permitting and explosives inspections through Senate Bill 03-329. The areas of duplication between the ATFE and DRMS eliminated by Senate Bill 03-329 are similar to the areas of duplication between the ATFE and the Division. For example, DRMS previously issued permits to entities that sold, used, purchased, manufactured, or stored explosives, similar to the Division's Type II and III permits, and conducted inspections of magazines that held explosives used for mining purposes. In response to the new legislation, the State entered into agreements with the ATFE and other federal agencies to allow DRMS to provide certain mine site explosives inspections and other assistance to the ATFE. DRMS has since changed its focus to primarily overseeing user safety in the mining workplace by assisting with the implementation of federal regulations through programs involving worker education and on-site inspections.

The Division should work with the ATFE to evaluate the functions performed by both organizations with respect to explosives and identify areas of duplication. The Division should then discontinue performing functions already performed by the ATFE. Additionally, the Division should establish agreements with the ATFE to allow the Division access to the ATFE's data on permittees so that the Division can verify that all necessary inspections are being completed and that any criminal history checks conducted by the ATFE are comprehensive and appropriately identify individuals with negative histories. According to the Division, there have been instances where the Division has identified individuals with negative criminal histories that the ATFE has not identified as having a criminal background. With these changes, the Division could focus its efforts in areas not regulated by the ATFE, such as explosive user permitting, inspection, and education, similar to DRMS. The Division will need to work with the General Assembly to redefine its role after this evaluation is completed. If, upon review of its regulatory functions, the Division retains responsibility for regulating certain aspects of the explosives program, the Division will need to improve its monitoring and oversight practices. The Division should also seek the statutory authority to assess civil penalties against permittees who fail to comply with statute and regulations.

Recommendation No. 16:

The Division of Oil and Public Safety should work with the General Assembly to redefine the State's role in overseeing explosives. This should include working with the Federal Bureau of Alcohol, Tobacco, Firearms, and Explosives to identify areas of duplication between the two programs and pursue statutory change to allow the Division to rely on the ATFE for certain regulatory functions. The Division should also establish interagency agreements with the AFTE to share information so that the Division can verify that all of the necessary inspections and criminal history checks are completed. Finally, the Division should focus its efforts on areas not currently regulated by the ATFE, such as conducting explosive user education and training.

Division of Oil and Public Safety Response:

Agree. Implementation date: July 2009.

The Division will perform a complete evaluation of the State's role in overseeing explosives. This will include working with the Federal Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATFE) to identify areas of duplication between the two programs. The Division will establish interagency agreements with the AFTE to share information so the Division can verify that all of the necessary inspections and criminal history checks are completed. The Division will focus its efforts on areas where there is not duplication such as conducting explosive user education and training and in areas identified through the evaluation where the Division is providing superior service. The Division will work with the General Assembly and pursue statutory changes to allow the Division to rely on the ATFE for certain regulatory functions, as identified through the evaluation. It is assumed that statutory changes would not be effective until at least July 2009 in order to evaluate effectiveness of interagency agreements.

Recommendation No. 17:

For areas where the Division of Oil and Public Safety retains responsibility for regulating the Explosives Program, the Division should improve its monitoring and enforcement to ensure permit renewals and inspections are timely, violations are documented, and follow-up and enforcement actions occur. Additionally, the Division should seek statutory authority to assess civil penalties, such as fines, against permittees who fail to comply with statute and Division regulations.

Division of Oil and Public Safety Response:

Agree. Implementation date: July 2008.

The Division will improve its monitoring and enforcement to ensure permit renewals and inspections are timely, violations are documented, and follow up and enforcement actions occur. As part of Recommendation No. 16, the Division will seek statutory authority to assess civil penalties, such as fines, against permittees who fail to comply with statute and Division regulations.

Boilers

The Division conducts inspections of all boilers in Colorado, with the exception of those located in the City and County of Denver. The City and County of Denver, pursuant to an agreement with the Division, conducts inspections for the boilers within its jurisdiction. A boiler is generally defined as a closed pressure vessel in which water is heated and circulated, either as hot water or as steam, for heating or power. Boilers are often located in public schools, churches, hotels, restaurants, nursing homes, office buildings, car washes, and dry cleaners. There are several different types of boilers including copper-tube, cast iron, cast aluminum, electric, and gas-fired boilers. These boilers maintain water in either steam or liquid form. Boilers operating at higher temperatures and pressures are at a higher risk of exploding and causing serious injuries than those operating at lower temperatures and pressures, such as copper-tube boilers. The Division does not regulate most water heaters and boilers that are used in individual residences.

Inspections

According to the statute (Section 9-4-103(4), C.R.S.), “Inspectors shall carefully inspect every boiler used or proposed to be used in this State for steaming, hot-water heating purposes, or hot-water supply, including all attachments and connections, in accordance with the inspection schedule established pursuant to subsection (3) of this section.” Subsection 3 of the statute requires the Division to formulate rules establishing a schedule for inspecting boilers. Pursuant to statute, the Division promulgated rules that relate to the frequency of boiler inspections. Prior to May 2002, regulations required that all boilers be inspected annually. Beginning May 2002, the Division implemented a limited risk-based inspection schedule to allow some boilers to be placed on a biennial inspection cycle. At that time, the Division placed some lower risk copper-tube boilers, that were not located in a building with a vulnerable population, such as children, to be placed on a biennial inspection

schedule. In July 2006, the Division adopted the inspection cycles recommended by the American Society of Mechanical Engineers (ASME) and the National Board of Boiler and Pressure Vessel Inspectors (the National Board). These organizations recommended that boilers be inspected on an annual, biennial, or triennial basis depending on the type and location of the boiler. For example, the National Board continued to recommend placing lower risk boilers, such as copper-tube boilers, on a biennial inspection cycle and also recommended placing boilers that have a person who monitors the boiler's operations on a continuous basis to be inspected triennially.

Boiler inspections are conducted by either one of the Division's six inspectors or an insurance company that insures boilers. The Division is required to conduct an initial inspection of all newly installed boilers. Division regulations, however, allow companies that insure boilers to conduct routine annual or biennial inspections of the boiler, subsequent to the initial inspection. Whether inspectors are employed by the Division or an insurance company, the Division requires that they be licensed by the National Board within at least one year of inspecting boilers for the Division. Routine on-site inspections generally include checking the boiler's pressure, fuel system, valves, controls, and air ventilation. The initial inspection of a newly installed boiler generally takes about one hour to complete. A subsequent routine or follow-up inspection generally takes about 30 minutes, not including time spent traveling to the boiler's location or entering inspection data into FOCUS, the Division's boiler database. The Division issues a certificate to the boiler owner after the inspection is completed and all violations have been corrected. As of December 2005, there were about 32,300 active boilers registered with the Division. Of these, about 14,400 boilers (45 percent) were assigned to the Division to inspect and about 17,900 boilers (55 percent) were assigned to insurance companies to inspect. The 32,300 active boilers registered with the Division do not include the approximately 8,800 boilers inspected by the City and County of Denver discussed later in this section.

We reviewed a sample of 60 boilers inspected by either Division inspectors or insurance company inspectors between January 2000 and March 2006. For the 60 boilers, there were a total of 157 inspections conducted over the six-year period. We found 57 of the 157 (36 percent) inspections were late or did not occur within the required inspection interval. Specifically, 22 inspections (14 percent) were up to one month late, 24 inspections (15 percent) were up to six months late, 6 inspections (4 percent) were up to 1 year late, and the remaining 5 (3 percent) were never inspected within the required inspection interval. We found that both Division and insurance company inspectors were responsible for the late inspections in our sample. Of the 60 boilers in our sample, 51 were on an annual cycle during the entire period reviewed. The remaining 9 were on an annual inspection cycle until May 2002 at which point they were placed on a biennial inspection cycle.

Boilers that are not in good repair or not functioning properly may explode and cause injury to people and property. According to information from the National Board, the periodic inspection of boilers is critical to protect against this risk. Therefore, timely inspections are important to ensure that problems are identified and corrected as soon as possible. Violations are frequently found during inspections. From our sample of 60 boilers, we found 18 (30 percent) where the inspector identified a violation during a routine inspection. These violations included incorrect boiler installations, defective relief valves, leaking seals, and the presence of combustible material in the same room as the boiler. For 3 of the 18 boilers, the violations were serious enough that the boiler had to be shut down until it was repaired.

One factor contributing to the number of untimely inspections is that the Division never fully implemented a risk-based approach to its inspection schedule. Since 2002 when the Division implemented a risk-based inspection approach, the Division has moved only about 5,000 of its 32,300 boilers (15 percent) to a biennial inspection schedule. These boilers were mostly copper-tube boilers, which have a lower risk of exploding. This means, however, that about 27,300 boilers remained on an annual inspection cycle.

It is important that the Division adopt an inspection schedule that takes into account the risks associated with boilers as well as the Division's resources. This is particularly important because the Division is expecting an increase in the number of boilers it will be required to inspect. The Division reports that beginning April 2007, the Division will be required to inspect approximately 8,800 boilers that were previously inspected by the City and County of Denver. All of these boilers will require an initial inspection by the Division before any can be inspected on a routine basis by an insurance inspector. As discussed previously, the City and County of Denver has been conducting inspections of the boilers in its jurisdiction for about 30 years pursuant to an interagency agreement with the Division. However, the City and County of Denver has terminated this agreement and, according to the Division, will no longer conduct these inspections as of April 2007. Although the Division has received funding for 3.5 additional Division inspectors from the General Assembly to manage the increased workload, it is important that the Division reevaluate its process for conducting inspections to ensure that all inspections are timely.

We identified several options the Division should consider to improve the timeliness of inspections. One option would be to fully implement the inspection schedule recommended by the National Board. As discussed above, in July 2006 the Division adopted the National Board's inspection cycle, which recommends that more boilers be placed on a biennial or triennial cycle depending on the boiler type, location, and whether the boiler is being monitored on a continual basis. According to the Division, its inspectors will assess which boilers meet the Division's new criteria for

a biennial or triennial inspection schedule when conducting routine inspections over the next year. On the basis of this assessment, the Division should determine the appropriate inspection schedule (one-year, two-year, or three-year) for each boiler. By placing more boilers on a two- or three-year inspection cycle, the Division would be able to target its resources more effectively and some boiler owners would save the costs of an annual inspection. In addition, the Division should also consider options such as requiring boiler owners to hire a qualified inspector to conduct routine inspections, contracting with third-party boiler inspectors, or a combination of these options. Implementing a requirement that boiler owners hire a third-party inspector to conduct inspections would likely require a statutory change.

Recommendation No. 18:

The Division of Oil and Public Safety should reevaluate its process for conducting boiler inspections to target resources more effectively and improve the timeliness of routine inspections. Options the Division should consider include:

- a. Completing implementation of the risk-based inspection schedule recommended by the National Board of Boiler and Pressure Vessel Inspectors and periodically evaluating the schedule to determine if further adjustments are necessary.
- b. Contracting with approved boiler inspectors to conduct inspections.
- c. Requiring boiler owners to hire a qualified inspector to conduct inspections, pursuing statutory authorization if necessary.

Division of Oil and Public Safety Response:

Agree. Implementation date: July 2008.

- a. The Division has implemented the risk-based inspection schedule recommended by the National Board of Boiler and Pressure Vessel Inspectors. The effect of the change should be felt in July 2007 and forward, when one inspection cycle has been completed. Due to work load and the allocated FTE, the Division will continue to evaluate and refine the inspection schedule.
- b. The Division agrees to consider the need to hire boiler inspectors as contractors when the risk-based inspection cycle is in full effect, which is expected to be in July of 2008.

- c. The Division agrees to consider the need for boiler owners to hire qualified independent inspectors to conduct inspections and if deemed necessary, to pursue statutory authorization.

Violations

When violations are found during a boiler inspection, the inspector prepares a violation report and provides a copy to the boiler representative who is generally on-site during the inspection. The inspector enters the violations into the Division's electronic database, called FOCUS. The FOCUS system at the Division's headquarters automatically generates an official violation notice that is mailed to the boiler owner. The violation notice contains a form that requires the boiler owner to correct the problem and obtain a signature from the contractor who fixed the boiler certifying that the boiler was repaired. This form is required to be returned to the Division within 45 days of the notice date. If the owner fails to reply, the Division's practice is to send a second violation notice giving the boiler owner an additional 45 days to correct the problem. The Division will not issue a boiler certificate to the owner until the notice is received. The boiler certificate acts as proof that the boiler has been inspected by the Division and all violations have been corrected. If the boiler owner still fails to submit the required documentation, the Division's only recourse, according to statute, is to shut down the boiler until the boiler is brought into compliance, and/or pursue criminal charges against the boiler owner.

According to the Division's records, inspectors found about 51,600 violations between January 2000 and December 2005 during boiler inspections. About 44,600 (86 percent) of the violations were identified by Division inspectors and the remaining 7,000 (14 percent) were identified by insurance inspectors.

We reviewed a sample of 60 boilers inspected between January 2000 and March 2006. Of the 60 boilers inspected, 18 (30 percent) boilers had a violation that was noted during an inspection. Some boilers had only one inspection during this period, while others had two or three. In total, 26 inspections were conducted on these 18 boilers during this period. We reviewed all 26 inspections and found for 25 of the inspections, the owners either failed to submit a notice of correction in a timely manner or failed to submit a notice altogether. Specifically, the owners submitted a notice of correction for 15 of the inspections identifying violations, but the Division did not receive the notice of correction until after the 45-day deadline. These notices were between 2 and 113 days late. For three of the inspections, the violations were serious enough that the boilers were "red tagged" and shut down until the boiler was repaired and the Division conducted a follow-up inspection. For the remaining seven inspections, the boiler owner never submitted a notice of

correction. However, the Division did not shut these boilers down or pursue criminal charges against the owner. During the Division's next annual or biennial inspection of the seven boilers that never submitted a notice of correction and the three boilers that had to be shut down, the Division found that for all but one boiler, the violations had been corrected. For one boiler, the Division found one of the same violations during its next routine inspection of the boiler.

Inspections are the primary tool used to identify noncompliance with boiler regulations. Therefore, by not receiving confirmation that a boiler violation has been corrected, the Division cannot ensure boilers are operating safely. Most violations identified during a routine certificate inspection allow the boiler to continue operating and do not require a follow-up inspection, but the deficiency may worsen over time and hinder safe operation of the boiler. Additionally, since the Division does not issue a boiler certificate until a correction notice is received, all 18 boilers operated for a period without a current certificate. According to statute (Section 9-4-106(5), C.R.S.), boiler owners are required to have a valid certificate to operate their boiler.

We identified two areas the Division needs to address to improve its enforcement of boiler violations. First, we found that boiler owners were not receiving the second follow-up letter when notices of correction were not received within 45 days of the violation notice date. According to the Division, the function in FOCUS that automatically issues the second notice was disabled in mid-2004. During this time, there was a change in management and the new manager was not aware that the function had been disabled. When the Division ran reports from FOCUS, the Division assumed that all violations had been corrected, since the report showed no overdue violations. This problem was not discovered until about June 2006 when the Division was reviewing our findings related to boiler inspection violations. The Division has since reenabled this function and is now issuing second notices.

Second, we found that the Division has limited penalties available for enforcing boiler violations that are not corrected in a timely manner. Statute does not authorize the Division to issue fines for violations; rather the statute only authorizes the Division to shut down the boiler until it is brought into compliance, or pursue criminal charges against the boiler owner. The Division does not generally pursue these remedies because they are very punitive and may not be warranted in instances where the violation is not serious enough to require shutting down the boiler. For example, one of the boilers in our sample had a relief safety valve that was inoperable and the owner never submitted a notice of correction to the Division. The Division did not shut this boiler down because of the lower risk associated with this violation, but in this case a fine might have been a reasonable incentive to bring the owner into compliance.

In addition to the issues with the Division's lack of enforcement action when violations are not corrected in a timely manner, we also found that when some violations have been corrected, inspectors do not always enter the correction into the FOCUS system. When boilers are "red tagged" and shut down due to the seriousness of the violation, inspectors will conduct a follow-up inspection to ensure the boiler has been adequately repaired before it can be placed back into service. When this occurs, the Division requires that inspectors, as part of their follow-up procedures, change the violation status in FOCUS to "corrected." However, we found that inspectors are not consistently updating FOCUS to indicate that violations have been corrected after follow-up has been performed. In addition, the Division does not require inspectors to enter information into FOCUS showing that the inspector has been in communication with the boiler owner regarding the status of repairs. As a result, the system shows violations have not been corrected, when in fact they have been, or the Division is in the process of working with the boiler owner to fix the problem. Three of the boilers in our sample had significant problems and were "red tagged" and shut down. One boiler was shut down during a routine inspection in April 2001. A follow-up inspection in September 2001 showed no deficiencies. Although the boiler must have been fixed and placed back into service prior to September 2001, the inspector never entered this information into FOCUS. FOCUS continued to show that the violations from the initial inspection had not been corrected. Another boiler was shut down in January 2006, and as of the end of March 2006, FOCUS showed no record that the boiler had been fixed or that the inspector was working with the owner to correct the problem. According to the Division, the inspector had been working with the boiler's manufacturer to bring the boiler into compliance, but there was no record in FOCUS of this communication.

It is important that the Division keep accurate records and follow up when violations are not corrected in a timely manner. In order to improve timeliness, the Division should consider seeking the statutory authority to issue civil charges, such as fines, for failure to bring a deficient boiler into compliance.

Recommendation No. 19:

The Division of Oil and Public Safety should improve its enforcement practices for violations found during boiler inspections by:

- a. Ensuring boiler owners are notified when they do not provide confirmation that violations found during an inspection have been corrected within the 45-day deadline.

- b. Ensuring inspectors update records when a follow-up inspection is conducted on a boiler that has been shut down to accurately indicate whether violations have been corrected or whether problems still exist.
- c. Seeking statutory authority to assess civil penalties, such as fines, against owners who fail to correct violations found during inspections in a timely manner.

Division of Oil and Public Safety Response:

Agree.

- a. Implementation date: Implemented. The Division implemented a process to ensure that owners are notified when the State has not received notification that violations have been corrected within the 45-day deadline.
 - b. Implementation date: Implemented. The Division has implemented a policy requiring inspectors to update their records when a follow-up inspection is conducted to verify corrections have been made for boilers that were shut down.
 - c. Implementation date: July 2008. The Division agrees to seek statutory authority to assess civil penalties against boiler owners when the required violations are not made in a timely manner.
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Administration

Chapter 3

Background

The Division of Oil and Public Safety (Division) collects, processes, and stores data and documentation necessary to support and issue permits and collect fees for each of its public safety programs. The Division uses a Windows-based electronic database called FOCUS to manage information related to boilers, explosives, and public school construction. The Division also uses an MSACCESS database to manage information related to carnivals and amusement parks. Ensuring the security of these systems and safeguarding state assets from theft, tampering, loss, and damage is a critical function of the Division.

The Division's public safety programs are cash-funded. Various fees are charged for the Division's services ranging from \$20 for a boiler inspection to more than \$10,000 for a public school construction plan review. The Division's procedures for collecting fees are different for each of its public safety programs. For boiler inspections and public school construction plan reviews and inspections, the Division issues an invoice to the boiler owner or school district, respectively. For explosive and carnival and amusement park permits, the applicant submits the payment along with its application, and no invoice is issued. In Fiscal Year 2006 the Division collected a total of about \$1.3 million in fees from all of its public safety programs. The largest amount collected came from boiler inspections, totaling \$934,000 for the year.

State Fiscal Rules require state agencies to implement internal accounting and administrative controls that reasonably ensure financial transactions are accurate, reliable, and conform to State Fiscal Rules. This includes designing and implementing programs and controls to prevent, deter, and detect fraud. We reviewed the Division's controls over cash collections and access to automated systems and identified control weaknesses that increase the risk of errors and irregularities, as described below.

Cash Collections

The Division has six general steps related to cash collections, including (1) issuing invoices; (2) collecting payments; (3) recording payments in the FOCUS or MSACCESS databases; (4) recording payments in COFRS, the State's financial reporting system; (5) depositing payments in the bank; and (6) performing monthly reconciliation procedures. Each public safety program handles its own collection activities and has slightly different procedures for collecting and processing payments. In general, the Division either provides a service and issues an invoice or accepts an application with payment. Payments are mailed either directly to the Division or to a lock box operated by the Department of Labor and Employment's (Department's) finance office. These payments are recorded in the FOCUS or MSACCESS databases by Division staff and recorded in COFRS by the Department's finance office staff. We reviewed the cash collection procedures for each of the Division's public safety programs and found that duties are not adequately segregated, cash receipt logs are not maintained, and reconciliations and management review of accounting activities are not consistently performed. These problems are described below.

- **Segregation of Duties.** Control procedures should be designed to ensure that billing and collection activities are adequately segregated to protect against the misuse of state assets. In general, processes related to approving permits, issuing invoices, receiving payments, recording payments, and performing reconciliations should be performed by separate employees. If it is not feasible to have separate employees perform each of these functions, certain functions should be performed by different staff. For example, the individual who receives payments should not be recording payments into the financial system and performing the reconciliation. We found that duties are not adequately segregated within each of the public safety programs. For example, in the boiler and public school construction sections, one employee in each section creates invoices and occasionally receives and records payments. The explosive and carnival and amusement park sections do not issue invoices, but one employee in each section receives and records all payments. During the audit the Division made some changes to segregate duties in the boiler and public school construction sections. For example, in the public school construction section, duties related to creating invoices and receiving and recording payments in the FOCUS database were moved from one employee, who also approved permits, to an employee who was not involved in issuing permits. However, responsibilities were still not sufficiently separated so that each collection activity was conducted by a different employee, or that at a minimum, activities related to receiving the actual payment and recording the payment were performed by different

employees. Having the same person perform key components of the collection process weakens internal controls over cash because it provides an opportunity for errors, omissions, and fraud to go undetected.

Since each section within the Division is performing its own collection activities, the Division should consider consolidating the functions to streamline the process and properly segregate the collection activity from other incompatible duties. For example, the Division could set up a cash collections unit for the entire Division and assign one employee the responsibility for opening the mail, logging the checks, and sending the checks to the Department's finance office; another employee the responsibility for creating invoices, recording payments, and preparing the monthly reconciliation report; and a manager the responsibility for reviewing the reconciliation reports. Streamlining the cash collection process could create consistency among the different program areas, reduce the number of FTE involved in cash processing from seven to three, and improve the efficiency of the Division's operations.

- **Cash Handling.** Control procedures should be designed to ensure that all cash receipts are immediately logged at the time of receipt and all receipts are recorded and deposited. Each individual cash receipt should be identified and assigned a unique, sequential transaction number. All payments should be logged immediately, and the actual checks should be sent directly to the Department's finance section, deposited, and recorded in COFRS. Copies of the checks or a copy of the check log should be used by Division staff to record payment in either the FOCUS or MSACCESS databases. We found that the Division did not keep a log of all checks received through the mail or send the checks directly to the Department's finance office for processing and deposit. Instead, the actual checks were sent to each section (e.g., Boilers, Public School Construction, etc.) within the Division to record the payment and then the checks were sent to the Department's finance office. Failure to maintain a log of all checks received or to send the payments directly to the finance office increases the risk that all payments may not be recorded and deposited in the bank. To ensure that all receipts are accounted for, a log of all payments received through the mail should be maintained and periodically reconciled to payments posted in the Division's databases. In addition, all payments should be sent directly to the Department's finance office before the Division posts payments into the FOCUS or MSACCESS databases. Finally, the Division should consider other options for securing payments. Currently the Division uses a post office box for receiving a majority of boiler inspection payments. These payments are processed by the Department's finance office before they ever go to the Division. The Division should consider establishing post office or lock boxes where

payments for all public safety programs could be mailed directly to the post office or lock box and processed by the bank or the Department's finance office. The Department's finance office could provide a payment log to the Division to record payments into the FOCUS or MSACCESS databases, thereby minimizing the Division's access to the actual checks and reducing the risk of fraud.

- **Reconciliation.** Control procedures should be designed to require that reconciliation reports be produced that contain sufficient information for management to effectively monitor billing and collection activities. Without adequate reconciliation procedures, errors and misappropriation of assets could go undetected by management. We reviewed the Division's reconciliation procedures and identified two areas for improvement. First, we found the carnivals and amusement parks and explosives sections are not preparing reconciliation reports to compare information in the FOCUS and MSACCESS databases with COFRS to help ensure all revenue is accounted for. These two data sources should be maintained and controlled by separate employees so that the reconciliation is a reliable method for verifying that all payments received have been recorded. Currently staff in the carnivals and amusement parks and explosives sections receive and process all cash payments. Staff then report the amount received to the Department's finance office, which enters this amount into COFRS. The Department's finance office does not receive any independent data to verify the payment amounts reported by program staff and entered into COFRS. Therefore, payment reports run from the FOCUS and MSACCESS databases cannot be reconciled to COFRS because the data sources for the two systems are the same, which renders any reconciliation meaningless. Second, we found that the reconciliation reports prepared by the boiler and public school construction sections that compare payment data in FOCUS and COFRS could be improved to allow the Division to more efficiently account for all invoices issued. The FOCUS system automatically generates a sequential invoice number for each invoice issued. The Division could produce reports that include the beginning and ending invoice numbers for the month, as well as the total number of invoices issued during the month. The number of invoices could be compared with the sequence of invoices used during the month that the FOCUS system reports were issued. The Division's current reconciliation reports do not report this information, and staff must review the approximately 250 pages attached to the report and manually count invoice numbers to determine if any invoices are missing.

Since the Division does not have adequate controls over segregation of duties, cash handling, and reconciliation, it lacks assurance that revenues are accurately and completely recorded and that state assets are sufficiently safeguarded. Improving

controls in these areas will improve the efficiency of each of these functions and provide greater assurance that the Division's assets are sufficiently protected.

Recommendation No. 20:

The Division of Oil and Public Safety should strengthen its controls over cash collection processes by:

- a. Reevaluating and streamlining its transaction processing to ensure functions related to collecting, recording, and preparing and reviewing cash reconciliations are performed by different employees. One option could be to establish one unit that processes payments for the entire Division.
- b. Logging all payments received through the mail, sending the payments directly to the Department's finance office for processing, using the check log to record payments in the FOCUS and MSACCESS databases, and periodically reconciling the check logs to cash recorded and deposited. In addition, the Division should consider using post office or bank lock boxes for receiving all payments.
- c. Requiring that reconciliation reports contain sufficient information to account for the sequence of invoices issued and payments received, contain information from two independent data sources, and be prepared and reviewed by someone who does not have responsibilities related to collecting payments.

Division of Oil and Public Safety Response:

Agree. Implementation date: January 2008.

- a. The Division will evaluate options to streamline its transaction processing to ensure functions related to collecting, recording, and preparing and reviewing cash reconciliations are performed by different employees.
- b. The Division will work with the Department's Finance office to develop a process for Finance to log all payments received through the mail and to have payments sent directly to Finance for processing. The Division will use the check log to record payments in the FOCUS and MSACCESS databases, and periodically reconcile the check logs to cash recorded and deposited. In addition the Division

will consider using post office or bank lock boxes for receiving all payments.

- c. The Division will require that reconciliation reports contain sufficient information to account for the sequence of invoices issued and payments received, contain information from two independent data sources, and be prepared and reviewed by someone who does not have responsibilities related to collecting payments.

System Access

Controls should be designed to ensure the integrity, confidentiality, and availability of data contained in an agency's database. FOCUS and MSACCESS are the Division's primary data sources for records related to inspections, violations, and billing for the Division's four different public safety program areas. Due to the sensitive nature of the information contained in these systems, it is important that only authorized individuals are allowed to access the systems. The Division has four different access levels it uses when assigning system access to its employees. The access levels include "visitor," which allows read-only access to all areas in the system; "office staff," which allows access to financial records; "manager," which allows access to all records, including employee passwords, and financial and inspection records; and "Division inspector or insurance inspector," which allows access to all inspection records. The Division is able to restrict system access within each level to only those functions related to an employee's job duties. For example, the person who collects cash may be assigned the "office staff" access level but be restricted from being able to create, modify, or delete any financial records.

We reviewed the Division's controls for ensuring that access to the FOCUS and MSACCESS databases is restricted based on employment status and job duties, and identified two main problems. First, we found at least 12 current employees have "manager" access rights that allow these employees to view, create, and modify all employee passwords, financial records, and inspection records in the FOCUS and MSACCESS databases. These 12 employees include the managers of all four public safety programs, as well as staff working in these programs; an administrative assistant; information technology employees; and an employee who formerly worked in the boiler section but now works in the Division's oil program section. We also found at least five current employees have "office staff" access rights that allow these employees to view, create, and modify financial records in FOCUS and MSACCESS. These five employees include administrative assistants and staff working in the public safety programs. When employees have unlimited access to system data, the Division cannot ensure that records are reliable and assets are

adequately protected against fraud and misuse. Furthermore, the controls we suggested to segregate duties, discussed previously in Recommendation No. 20, will not be effective if electronic access is not also segregated in the FOCUS and MSACCESS databases. This requires restricting access to these systems on the basis of job duties.

According to the Division, one employee in each section typically performs most of the payment processing functions for that section, and each of these employees was provided broad access to the system to perform these functions. In addition, the Division provided its information technologists, administrative assistants, and program managers access to the system to help process payments, access inspection records, or access employee passwords if an employee forgot his or her password. The Division can accomplish these important business needs while still ensuring appropriate controls exist. The Division could allow certain users the ability to view all records (except for passwords) while limiting their ability to create or modify records based upon their job duties. To ensure password security in FOCUS, the Division should ensure only one employee has the ability to create a user account and only one manager has the ability to approve the user account. No employee should have the ability to view employee passwords. If a password is lost, one employee should have access rights that would allow this employee to reset the system so that a new password can be entered by the employee who lost his or her password. The employee who has access to reset the system should not have access to create or modify records.

Second, we identified current and former employees and inspectors (i.e., boiler inspectors for insurance companies) who had inappropriate access to the FOCUS system. Specifically, we reviewed records for the 110 individuals who have access to the various databases in FOCUS and MSACCESS and found:

- 16 former employees have the ability to create, modify, and view information such as billing and inspection records, even though they no longer work for the Division.
- 10 boiler inspectors (employed by insurance companies) have the ability to enter, modify, and view inspection records even though they no longer conduct boiler inspections on behalf of the Division.
- 1 employee has the ability to create, modify, and view financial records in the boiler section of FOCUS, even though this individual is working in a different section within the Division and his or her job responsibilities no longer involve use of the FOCUS system.

- 1 employee has two different user accounts. One account has “manager” access rights, which allows the employee the ability to create, modify, and view all records in FOCUS. The other account has “office staff” access rights, which allows the employee the ability to create, modify, and view financial records. On the basis of this employee’s job duties, he should only have “office staff” access rights.
- 2 anonymous accounts that are not attached to a specific employee. For example, one account has an employee user name of “visitor” and “office staff” access rights, and the other account has an employee user name of “Mike Contractor” with “insurance inspector” rights. According to the Division, there is no insurance inspector with this name. If an employee in the Division were to use either of these accounts to create, modify, or view records in FOCUS, the Division would have no way of tracing this activity back to an individual employee.

The prompt removal or disabling of accounts belonging to users who no longer require access to the system is a basic security control. When unauthorized individuals have access to the system, the reliability of the Division’s records can be impaired and the risk of fraud or error increases. Since inspection records in FOCUS can be accessed through the Web using an external computer, controls over account access are critical. Without these controls, there is a risk that former inspectors could alter, delete, or create false inspection reports without the Division’s knowledge. In addition, although billing records can only be accessed from a computer in the Division’s office, there is still a risk that current employees could inappropriately use former employee accounts to access or modify customer account information.

According to the Division, it does not review the list of individuals with access to the system on a consistent basis to ensure that only active employees and insurance inspectors are provided access to the system. In addition, when an insurance inspector leaves his or her company, the company is required to notify the Division. However, this does not always occur and the Division has not implemented other procedures to verify an inspector’s status.

The Division could correct its system vulnerabilities by ensuring that it periodically reviews a list of individuals with access to the system and eliminates and restricts access to employees based on their job duties. This could include reviewing all FOCUS and MSACCESS user accounts at least annually as part of the Division’s process for commissioning inspectors. Every January each insurance inspector must apply for and receive approval to conduct boiler inspections. The Division could use this as an opportunity to review access rights for all users. According to the Division, there are some inspectors who only conduct a limited number of inspections and, therefore, only need access to the system for a limited period. In

these cases the Division could consider allowing access to the system for specific periods. Finally, the Division should ensure that it addresses the current problems related to system access identified during the audit.

Recommendation No. 21:

The Division of Oil and Public Safety should strengthen its controls over system access by:

- a. Establishing standard procedures for periodically reviewing user accounts to ensure only current employees and insurance inspectors are allowed access to the system, access is limited only to the functions that apply to an employee's job duties, and passwords cannot be viewed by any employee.
- b. Implementing procedures for creating, resetting, and approving system passwords.
- c. Addressing the problems related to system access identified during the audit.

Division of Oil and Public Safety Response:

Agree. Implementation date: January 2008.

- a. The Division will establish standard procedures for periodically reviewing user accounts to ensure only current employees and insurance inspectors are allowed access to the system, access is limited only to the functions that apply to an employee's job duties, and passwords cannot be viewed by any employee.
 - b. The Division will work with the Department's Information Technology Management Office to implement procedures for creating, resetting, and approving system passwords.
 - c. The Division will address the problems identified during the audit related to system access.
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