2005 SUNRISE REVIEW

Colorado Department of Regulatory Agencies
Office of Policy, Research and Regulatory Reform

Crane Operators

October 14, 2005

STATE OF COLORADO

DEPARTMENT OF REGULATORY AGENCIES
Office of the Executive Director
Tambor Williams
Executive Director

1560 Broadway, Suite 1550
Denver, CO 80202
Phone: (303) 894-7855
Fax: (303) 894-7885
V/TDD: (303) 894-7880

Bill Owens
Governor

October 14, 2005

Members of the Colorado General Assembly
c/o the Office of Legislative Legal Services
State Capitol Building
Denver, Colorado 80203

Dear Members of the General Assembly:

The Colorado Department of Regulatory Agencies has completed its evaluation of the sunrise application for regulation of crane operators and is pleased to submit this written report. The report is submitted pursuant to section 24-34-104.1, Colorado Revised Statutes, which provides that the Department of Regulatory Agencies shall conduct an analysis and evaluation of proposed regulation to determine whether the public needs, and would benefit from, the regulation.

The report discusses the question of whether there is a need for the regulation in order to protect the public from potential harm, whether regulation would serve to mitigate the potential harm, and whether the public can be adequately protected by other means in a more cost-effective manner.

Sincerely,

Tambor Williams

Tambor Williams
Executive Director

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The Sunrise Process

Background

Colorado law, section 24-34-104.1, Colorado Revised Statutes (C.R.S.), requires that individuals or groups proposing legislation to regulate any occupation or profession first submit information to the Department of Regulatory Agencies (DORA) for the purposes of a sunrise review. The intent of the law is to impose regulation on occupations and professions only when it is necessary to protect the public health, safety or welfare. DORA must prepare a report evaluating the justification for regulation based upon the criteria contained in the sunrise statute:

> (I) Whether the unregulated practice of the occupation or profession clearly harms or endangers the health, safety, or welfare of the public, and whether the potential for the harm is easily recognizable and not remote or dependent upon tenuous argument;
>
> (II) Whether the public needs, and can reasonably be expected to benefit from, an assurance of initial and continuing professional or occupational competence; and
>
> (III) Whether the public can be adequately protected by other means in a more cost-effective manner.

Any professional or occupational group or organization, any individual, or any other interested party may submit an application for the regulation of an unregulated occupation or profession. Applications must be accompanied by supporting signatures and must include a description of the proposed regulation and justification for such regulation. Applications received by July 1 must have a review completed by DORA by October 15 of the year following the year of submission.

Methodology

DORA has completed its evaluation of the proposal for regulation of crane operators. During the sunrise review process, DORA performed a literature search, contacted and interviewed the applicants on numerous occasions, reviewed licensure laws in other states, conducted interviews of administrators of those programs, and met with insurance executives specializing in construction related policies and events. To better understand the profession of crane operators, the author of this report met with many members of the profession, as well as general contractors and members of the construction industry.

Proposal for Regulation

The Crane Operator Certification Committee (Applicant) has submitted a sunrise application to the Department of Regulatory Agencies (DORA) for review in accordance with the provisions of section 24-34-104.1, Colorado Revised Statutes (C.R.S.). As part of its sunrise application, the Applicant provided a Proposed State Standard for Crane Operator Certification. However, the Applicant subsequently proposed a "model act" to the General Assembly, in Senate Bill 05-219, which can be found in Appendix A on page 24.

The Applicant proposes state licensure for crane operators as the appropriate level of regulation to protect the public.

Licensure is the most restrictive of the various forms of what is known as "credentialing," i.e., the process of granting or gaining a "credential." "Licensure" generally refers to the mandatory governmental requirement necessary to practice in a particular profession or occupation, and usually includes an examination, sometimes in addition to the completion of appropriate training and/or experience. "Certification," on the other hand, is usually a voluntary process instituted by a non-governmental agency in which individuals are recognized for their knowledge and skill. Certification only becomes mandatory if it is adopted by a state or federal agency as the basis of a licensing program or if an employer requires it as a basis for employment.

The Applicant states that licensure is the appropriate level of regulation because it will have minimal impact on commerce, can be accomplished with little impact on the state budget, and will work within the existing state regulatory framework.

The following components characterize the proposed licensure/certification program:

1. Licensing program administered by DORA and limited to certified operators.
2. Certification of crane operators by an accredited certifying entity, with requirements that include:
    - Physical examination;
    - Substance abuse testing;
    - Written examination; and
    - Hands-on examination (practical operation of cranes).
3. Recertification at five-year intervals.
4. Trainee supervision.
5. Exemptions to certification requirement:
    - Operators of mobile cranes that have a boom length of less than 20 feet or a load capacity of less than 15,000 pounds;
    - Operators who are members of the armed services and who operate cranes during the course of military duty;

- Employees of municipal utilities or public utilities under the jurisdiction of the Public Utilities Commission;
- Railroad employees;
- Individuals operating cranes on their own private property; and
- Employees of mining operations or employees of independent contractors of mining operations subject to regulation by the federal Mine Safety and Health Administration.

6. Administrative fining authority of $1,000 for violation of the article.

7. Enforcement by DORA.

The Applicant proposed legislation in the 2005 General Assembly requiring that all Colorado crane operators acquire certification by an accredited certifying entity as a prerequisite to state licensure (Senate Bill 05-219 is attached as Appendix A beginning on page 24). Senate Bill 05-219 does not substantially conflict with the Applicant's sunrise review application, consequently it is reasonable to conclude that the provisions in the proposed legislation are representative of the regulatory program envisioned by the Applicant. Pursuant to the Applicant's proposal, no additional requirements, other than certification by an independent entity, would be necessary for initial licensure, or to maintain said crane operator license for the proposed five-year licensure period. This proposal does not afford the protection to the public that the General Assembly has granted to other traditional occupational regulatory programs in DORA. The following items, all of which are completely absent from Senate Bill 05-219, are typically found in most agencies', boards' and programs' organic statutes:

1. Proposal did not provide for revenue sources other than the authority to assess a $1,000-fine for crane operators who have not obtained certification.

2. Proposal did not require that DORA issue a certificate of competency to qualified applicants. It only required DORA to enforce the requirement that crane operators obtain a certification offered by an outside, private agency or organization.

3. Proposal did not provide for any statutory violations or penalties other than a $1,000-fine for crane operation without proper certification. Other state regulatory programs have disciplinary, sanctioning authority, and other remedial actions deemed appropriate and necessary for the protection of the public.

4. Proposal required enforcement by DORA. However, the act did not have provisions for any form of investigations or inspections of certificate holders.

5. Although the bill required that DORA enforce the act, the proposed legislation did not grant any subpoena power to DORA.

6. Proposal did not provide for rulemaking authority for DORA.

7. Proposal failed to address issues of the complaint, disciplinary, and administrative processes.

8. Proposal did not indicate the type of regulatory entity that would administer the article's provisions and decide policy issues.

9. Proposal did not address the application process, including requirements, criteria, experience, and costs/fees associated with a regulatory program.

10. Proposal did not include any reference relating to legal services.

Most boards, agencies and programs in DORA's Division of Registrations have statutory provisions that contain all or most of the items listed above. These are considered necessary requirements for state entities to adequately protect the health, welfare, and safety of the citizens of Colorado.

Profile of the Profession

Cranes are vital and essential pieces of equipment on most major building and construction sites in Colorado and throughout the country. The three main types of cranes (the same that are being contemplated here for regulation) include the tower, mobile, and crawler cranes. Crane operators operate mechanical boom and cable or tower and cable equipment to lift and move materials, machinery, or other heavy objects. They extend or retract a horizontally mounted boom to lower or raise a hook attached to the load line. Most operators position the loads in response to hand signals and instructions transmitted by radio.

Cranes are utilized for many purposes other than heavy construction projects, including tree removal and service, house remodeling, moving utility sheds, hot tubs, and roofing materials in both residential and commercial settings. Frequently, cranes work near, around, and over the general public in areas such as highways, schools, office buildings and construction projects. Cranes are also utilized to hoist air conditioning and heating equipment, building materials, bridge girders, and perform numerous other tasks. Cranes vary in size with boom lengths that may exceed 400 feet.

In recent years, cranes have become more task-specific and more complicated to operate. Cranes have become increasingly sophisticated and technologically advanced and modern cranes often have computers in the crane cab to assist the operator and allow the crane to effect a more versatile operation. This increased sophistication in the machinery requires that a crane operator periodically upgrade his or her knowledge and skills in order to keep abreast with evolving and advancing technology. Today's cranes are computer designed to weigh less and be more flexible, while still having the ability to hoist heavier weights. Although modern cranes are easier to set-up and move, the margin of error for accidents has decreased due to the structural design and increasingly complicated controls.

Over the past few decades, there has been a significant increase in the cost of cranes due in part to improved engineering design and specific job site requirements. For instance, the cost of one 150-200 ton mobile crawler crane alone is in excess of $800,000, and, depending upon capacity and added components, can exceed $1 million.

The availability of data and statistics required for an extensive review and analysis of crane operators, at both a national and state level, is lacking. Consequently, there is no accurate or reliable data as to how many crane operators are working in Colorado, although Colorado crane experts estimate that there are between 1,000 and 3,000 statewide. However, not all Colorado crane operators would require licensure pursuant to the proposed regulation.

The Occupational Safety and Health Administration estimates that there are over 250,000 crane operators nationwide, with approximately 125,000 cranes currently in operation in the construction industry, and an additional 80,000-100,000 cranes in general and maritime industries.

Summary of Current Regulation

The Colorado Regulatory Environment

At the present time, the state of Colorado does not require certification or licensure of crane operators. In addition, there are no regulations for crane operators in Colorado on a county, district, or municipal level.

Federal Regulation

The federal government, through the Occupational Safety and Health Administration (OSHA), has rules and regulations in effect that control and guide many aspects of crane operation, but are less than comprehensive when it comes to the issue of crane operator expertise, education, and training. The OSHA standard for construction says very little about operator qualifications for the various cranes in use today. The only direct statement the standard makes is found in title 29 of the Code of Federal Regulations (C.F.R.), section 1926.20(a)(4), which states, “The employer shall permit only those employees qualified by training or experience to operate equipment and machinery.” The section that specifically covers cranes, 29 C.F.R. section 1926.550(a)(1), states, ”The employer shall comply with the manufacturer’s specifications and limitations applicable to the operation of any and all cranes and derricks.”

The safety code for crawler, truck, locomotive, and mobile lattice boom cranes was codified by the American National Standards Institute/American Society of Mechanical Engineers, in ANSI/ASME B30.5-2000, which ultimately revised ANSI/ASME B30.5-1968. The 1968 standards, which are considered the definitive standard on crane operation and usage, did not provide for or contain the requirements or criteria set forth in the revised standards of 1995 and 2000. Consequently, the ANSI/ASME B30.5-2000 criteria and requirements are considered only a “recommendation,” and are not a legal requirement. However, some crane manufacturers now warn crane buyers that operators of their cranes must follow the latest ANSI/ASME standard for crane operation. OSHA, in 29 C.F.R., section 1926.550(a)(1), directs that the employer shall comply with crane manufacturers specifications and limitations. This declaration makes the latest ANSI/ASME B30.5-2000 the federal standard on many new cranes, although not on older cranes.

Section 5-3.1.2 of ANSI/ASME B30.5-2000 sets forth the specifics of current recommended crane operator qualifications as follows:

- Adequate vision (with or without corrective lenses)
- Ability to distinguish colors
- Adequate hearing (with or without a hearing aid)
- Sufficient strength, endurance, agility, coordination, and reaction speed
- Normal depth perception, field of vision, manual dexterity, and no tendency of dizziness
- Successfully pass a drug test
- No physical defects or emotional instability that could be a hazard
- No tendency of seizures or loss of physical control sufficient for disqualification

Operators are required to:

- Successfully pass a physical examination every three years;
- Satisfactorily complete a written examination appropriate to the particular crane type;
- Demonstrate the ability to read, write, and perform arithmetic and load chart usage;
- Satisfactorily complete testing on the crane's load charts for appropriate configurations;
- Complete an operating examination demonstrating proficiency in handling a specific type of crane; and
- Demonstrate knowledge of ANSI/ASME B30.5-2000 standard; and federal, state and local requirements.

Federal law, at 29 C.F.R. section 1926.550(a)(17), also requires that employers comply with Power Crane and Shovel Association (PCSA) Mobile Hydraulic Crane Standard #2 (PCSA Standard #2). PCSA Standard #2 covers hydraulic cranes only, and in section 8.3.1 states:

> The operator should be fully competent physically, mentally, and emotionally to understand and apply established operating safety rules. He should be able to exercise good judgment in dealing with the many situations that cannot be anticipated and covered herein.

This standard is stated in such general terms as to make it without value in a regulatory environment.

Crane Operator Certification Entity

Many of the states that require crane operator licensure rely on the National Commission for the Certification of Crane Operators (NCCCO) as their certification testing entity. The NCCCO is an independent, not-for-profit organization incorporated in 1995 to establish and administer a national program for the certification of crane operators. In February 1999, the NCCCO national crane operator certification program was recognized as meeting OSHA's requirements for crane operator competency. The NCCCO is the only crane certification-testing program that has been recognized and approved by OSHA.

The testing program has been formulated to meet the standards criteria as set forth by OSHA in 29 C.F.R. section 1926.550 and ANSI/ASME B30.5-2000. Among the stated goals of the NCCCO's nationwide certification program are fewer accidents, reduced risk of loss, more consistent training, and expanded job opportunities for crane operators. The NCCCO indicates that its program centers around three specific areas:

- Validating crane operators' knowledge and proficiency;
- Developing and administering examinations to test that knowledge and proficiency; and
- Issuing certifications to those operators who meet the criteria for crane operator certification.

Examinations are conducted on demand at many sites across the U.S. In its first eight years, the NCCCO tested more than 22,000 crane operators at 1,100 separate test sites in 48 states. Based on OSHA's estimate of 250,000 care operators nationwide, this indicates that approximately 90 percent of crane operators are not certified. A certification card is issued to those operators who meet the requirements of written, medical, and practical (hands-on) examinations, and demonstrate their fundamental knowledge and skill in safe crane operation.

Regulation in Other States

Colorado is not the only state that has tried to determine whether and/or how to regulate crane operators. As of the date of this sunrise report, only 13 states have some form of licensure requirement for crane operators. These states include:

- California (effective June 2005)
- Connecticut
- Hawaii
- Massachusetts
- Montana
- Nevada
- New Jersey
- New Mexico
- New York
- Oregon
- Rhode Island
- West Virginia
- Minnesota (effective July 2007)

Recently, legislation has also been introduced in Illinois, Michigan, Utah, Pennsylvania, and proposed in Alaska.

Additionally, six cities require licensure/certification of crane operators, including:

- Chicago
- Los Angeles
- New Orleans
- Omaha
- New York
- District of Columbia

Summaries of the following four states (Montana, New Mexico, California, and Minnesota), all of which require a form of licensure, illustrate two representative levels of regulatory involvement that the various states utilize in their regulatory schemes of crane operator licensing. The first level is merely predicating licensure on the certification of applicants by a national independent certification entity. The second level entails a more comprehensive regulatory scheme that may include rules and regulations encompassing state testing for certification and discipline generally consistent with existing licensure regulations and procedures.

Montana

Montana was one of the first states to require licensure of hoisting equipment operators, as its original legislation dates back to the year 1915. Montana's regulations have undergone many amendments and revisions over the years, with the latest revision taking effect on October 1, 2005.

Montana currently has 1,584 active crane licensees in 12 different categories of crane operator (this includes several classes of crane operators in the Montana mining industry). As of the date of this writing, Montana only processes about 10 disciplinary cases per year, as it is limited to infractions of unlicensed crane operators.

Montana's program does not include a "board", but rather a "program" which has two administrators, a program specialist (program manager), and a crane inspector. The crane inspector is responsible for traveling around the state and visiting and inspecting various construction sites at which cranes are being operated. This individual has the authority to shut down a crane due to violations of Montana's licensure requirements, in addition to an escalating fine schedule for repeat offenders. The program specialist is the actual program manager for the Montana crane operator licensure program. Montana offers its own written and practical examinations and this program specialist is in charge of examination administration, as well as keeping records of the individuals licensed by the program.

The legislation that becomes effective on October 1, 2005, will allow NCCCO certified operators to have reciprocity, and will expand the enforcement powers of the program to include cease and desist authority. The Montana program has an attorney assigned to it for legal services necessary to promote compliance with the regulatory scheme.

Montana regulatory authorities indicate that there are several reasons for the high percentage of crane operators for the relatively small population of Montana (population 920,000). Most notably, Montana has a large mining industry which utilizes cranes in many capacities, Montana has required crane operator licensure for a great deal of time, and crane operators that travel to Montana for one job or seasonal work are still required to acquire a state license.

New Mexico
New Mexico enacted legislation effective January 15, 1997, entitled "Hoisting Operators Safety Act and Rules." Although this act provides for mandatory licensure of crane operators, this piece of legislation was somewhat flawed according to New Mexico crane officials. The act permitted construction companies to perform "in-house" training that allowed New Mexico's crane operators to be exempt from state licensure requirements. The in-house training consisted of 16 hours of classroom work, with no operational or practical training involved. As a result of this greatly reduced standard, New Mexico has 50 licensees as opposed to 300 licensees when the statute was originally enacted in 1997. New Mexico's crane certification program administrator attributes this major decline of crane licensees to the in-house training loophole and the lack of any comprehensive testing or assurance that the training was meaningful.

Although New Mexico has enacted a comprehensive statutory system, the state averages less than one complaint a year, and has not taken any disciplinary actions within the last five years. The manager of New Mexico's Regulation & Licensing Department, Construction Industries Division, attributes this lack of action to a budget that fails to provide for an investigative arm, legal services, or any field inspectors to routinely or randomly inspect crane installations to determine whether there is compliance with crane operator statutes.

State administrators indicated that new legislation in New Mexico (SB 228) provides for state licensure for all crane operators. Additionally, testing will become a state run program.

New Mexico can only estimate the number of crane operators in the state. However, officials anticipate over 300 licensees when the regulations change to eliminate in-house training in October 2005. New Mexico currently has one full-time employee, the program administrator, allocated to the program.

California
Effective June 1, 2005, California began requiring mandatory state licensing of crane operators, with certification by an accredited entity as a prerequisite to state licensure. Under this new law, California employers cannot allow crane operators to use a 7.5 ton capacity or larger crane without having the employee pass written, drug, physical and practical examinations audited by the National Commission for Certifying Agencies (NCCA). California does not provide or establish a state run testing program, instead relying on the independent testing organizations for the certification process. California is believed to have the largest pool of crane operators in the country, with estimates between 12,000 and 20,000 individuals actively operating crane equipment. As of June 1, 2005, less than 2,000 crane operators had received full certification, and it is reported that many thousands wait to begin testing or to retake failed examinations. The largest testing entity, the NCCCO, indicates that the NCCCO has certified nearly 1,000 crane operators in California. However, when the new rule was first announced in 2003, NCCCO had certified only 92 crane operators in California.

Reports from California's insurance industry indicate that the crane operator community is in somewhat of a frenzy scrambling to obtain certification, and that the state is considering granting temporary waivers to employers demonstrating good-faith efforts to have operators certified. California officials originally announced this new licensure requirement in 2003. However, most crane operators in California apparently thought that the certification deadline of June 1, 2005, would be extended to allow more crane operators to acquire the mandated certification. This deadline was not extended and the delay and procrastination of many California crane operators to acquire certification has led to a minor disruption in the California construction industry.

Minnesota

Legislation was recently passed in Minnesota requiring that crane operators acquire a valid certificate of competency when operating a crane with a lift capacity of five tons or more.

Enforcement of Minnesota's mandatory certification program is administered by that state's OSHA program, and penalties escalate with each subsequent violation. Minnesota's crane operator certification regulations become effective July 1, 2007, to allow crane operators adequate time to acquire a valid certificate of competency. Minnesota will not be providing the actual written and practical testing, rather they will rely on testing by, and require a certificate of competency from, a nationally recognized and accredited certification program. The only such program in Minnesota at this time is the NCCCO.

Noteworthy are the statutory exemptions set forth in Minnesota's legislation. Minnesota exempts the following individuals, categories, and situations from the certification requirements:

- Railroad employees
- Employees of public utilities, municipalities, telephone companies, or industrial manufacturing plants
- Military personnel
- Individuals operating cranes for personal use on their own property
- Persons regulated under the Mine Safety and Health Act

Analysis and Recommendations

Public Harm

The first sunrise criterion asks:

> Whether the unregulated practice of the occupation or profession clearly harms or endangers the health, safety or welfare of the public, and whether the potential for harm is easily recognizable and not remote or dependent on tenuous argument.

Cranes are a central component of many construction operations, and estimates suggest that cranes are involved in up to one-third of all construction fatalities and serious injuries (*Crane Related Deaths in the U.S. Construction Industry, 1984-1994*).

Construction work differs from other industries in that workers are continuously confronted with new challenges and potential dangers as the work site progresses and evolves. The nature of construction work is complicated and constantly changing; and the federal Occupational Safety and Health Administration's (OSHA's) studies indicate that the construction industry has high injury and fatality rates when compared to most other U.S. industries. In a typical industrial setting, workers are exposed to the same environment and hazards every day. In contrast, a crane operator may work for several different employers over the course of a year, and at many different work sites, which may be a factor in crane accidents. Despite the relatively high rates of fatalities and injuries in the construction/crane industry, very little research and few studies have focused on the numbers and etiology of crane-related incidents.

In support of the Crane Operator Certification Committee's (Applicant's) contention that regulation of crane operators in Colorado is necessary to protect the health, welfare, and safety of the public, the sunrise application included the following crane incident summaries. The incidents reported herein occurred mostly in Colorado. (note: the application attachments indicate that additional Colorado crane incidents can be documented, although they are not specifically listed in the sunrise application.)

Incident #1

On April 3, 2002, a crane working on the Transportation Expansion Project (T-REX), a highway construction project in Denver, toppled over when, according to OSHA investigators, the owner/operator operated his mobile crane outside the manufacturer's specifications. OSHA found that the operator improperly followed a load rating chart for fully extended outriggers, when, in fact, two of the crane's outriggers were retracted close to the body of the crane (outriggers are the steel feet that telescope out to provide stability for the crane's operation). There were also problems with the boom angle and the lack of front tire contact with the ground.

The crane hit two cars, injuring three people and causing the freeway to close in both directions to the inconvience of thousands of motorists.

Incident #2

On May 3, 2004, an apartment project in Vail, Colorado was shut down for several days following a crane accident. The accident occurred when a crane was delivering a load of lumber on the construction site. The boom started to tip towards a building, at which point the operator swung the load back toward the crane. Before the operator could get the load back under control, the back tracks on the base of the crane tipped up, towards the buildings. At that point, the crane tipped over between the buildings under construction. Although no one was injured, the expensive crane was destroyed, and the housing project delayed.

Incident #3

In May 2004, a crane operator shut down a crane without applying the swing brake in the cab. Thirty minutes later, the crane swung into a 130,000-volt power line, killing all the power in Parker, Colorado. No one was hurt in this accident. However, the economic impact was no doubt substantial. It was alleged by the Applicant that the crane operator was not properly trained or competent in crane operation.

Incident #4

On January 8, 2002, a crane operator in Florence, Colorado allegedly misrepresented his crane expertise to his employer, and attempted to operate a crane for which he had no previous experience. This 230-ton capacity crane with 453 feet of vertical reach was brought crashing down when the operator pulled the wrong lever and could not detect signs of failure in the crane's boom until it was too late. As a result, an ironworker suffered an amputation of his leg due to the boom's collapse and the incident cost over $2 million in repairs.

Incident #5

On August 9, 2001, a crane operator failed to interpret the crane's load capacity charts, and consequently tipped over a 165-ton crane onto a building under construction. Although no one was hurt in this event, the financial impact to the employer, general contractor, and building owner ran into the hundreds of thousands of dollars.

Incident #6

On December 12, 2001, the owner of Avatar Crane Service operated a crane on a jobsite in Aurora, Colorado, in immediate proximity to live electrical power lines. Due to his actions, the crane operator contacted the power line that was in plain view, and electrocuted an ironworker that was working with the crane. It is alleged by the Applicant that the crane operator operated the crane without receiving proper training in operational techniques and crane safety.

Incident #7

On December 17, 1998, a crane operator who was erecting precast concrete panels on a building under construction in Englewood, Colorado tipped a crane over onto the building because of his inability to hear the proper signals from the radioman that was directing the crane operator. Additionally, this operator, with 20 years of experience, could not read the crane's capacity charts nor interpret the charts. The operator's response was that "he could feel the crane's balance point in the seat of his pants." Costs were estimated to be in the range of hundreds of thousands of dollars.

These incidents, submitted by the Applicant, do not delineate whether these individual crane operators were certified or non-certified. Therefore, one cannot conclude that certification eliminates crane accidents. Regardless, just as a driver's license does not ensure that a motorist will not cause an automobile accident, it is important to recognize that crane accidents can occur with both certified and non-certified operators.

A study was performed in Ontario, Canada (see Appendix C on page 38), which reviewed the rate of crane-related fatalities over a 34-year period (1969-2002). There were no crane operator training requirements in Ontario until 1979, when training programs were initiated for journeymen crane operators in the construction industry. In 1982 all new crane operators were required to attend a crane operator training school as part of the licensure process. Ontario reported a 51.5 percent reduction in fatal crane accidents after requiring training as opposed to the period prior to the training requirement (1969-1978). Although the report attributed this improvement primarily to mandatory crane operator training programs, other factors relating to crane safety, including increased awareness of electrical powerlines and improved equipment and techniques, were not discussed or considered. Additionally, this report limited its review to fatalities and did not review or consider data on accidents involving cranes that did not result in fatalities. This failure to conduct and include an analysis on crane accidents greatly limits the usefulness of this study for the purpose of this sunset report.

The type and number of injuries related to crane mishaps are difficult to quantify because reported statistics on work related injuries usually group cranes in larger categories, such as “industrial vehicles and equipment” or “equipment and machinery.” Two of the following tables are found in the most comprehensive U.S. study relating to fatalities caused by crane incidents. The report, *Crane Related Deaths in the U.S. Construction Industry, 1984-1994,* acquired much of its data from information derived from OSHA investigations.

For the time period 1984-1994, OSHA investigated 479 incidents that resulted in 502 deaths involving cranes in the construction industry. Slightly more than one-half of the fatalities occurred as a result of either electrocution (usually a boom contacting a high-voltage cable) or during the assembly/dismantling process. Other major categories causing fatalities were boom buckling, crane upset/overturn, and rigging failure. Surprisingly, crane operators themselves comprised only 65 (13 percent) of all deaths from accidents involving cranes. Statistically, it is important to note that the vast majority (approximately 85 percent) of crane-related fatalities resulted in the deaths of construction or other workers, rather than crane operators themselves. For workers who were not crane operators, deaths from power-line contact represented the largest category with 179 (36 percent) of the fatalities.

Table 1

U.S. Crane Related Deaths
1984–1994

Circumstance of Death	Number of Deaths	Percent
Electrocution	198	39%
Crane Assembly/Dismantling	58	12%
Boom Buckling/Collapse	41	8%
Crane Upset/Overturn	37	7%
Rigging Failure	36	7%
Other	24	5%
Overloading	22	4%
Struck by Moving Load	22	4%
Accidents Related to Manlifts	21	4%
Working within Swing Radius of Counterweight	17	3%
Two-Blocking	11	2%
Hoist Limitations	7	1%
Killer Hooks	3	1%
Access/Egress	2	<1%
Control Confusion	1	<1%
Insufficient Information	2	<1%
Total	**502**	**100%**

Source: *Crane Related Deaths in the U.S. Construction Industry, 1984-1994.*

Table 2

Deaths of Crane Operators and Other Workers
1984-1994

	Crane Operators	Other Workers	Not Specified	Total
General Construction	10	62	1	73
Heavy Construction	31	187	9	227
Special Trade Construction	24	177	1	202
Total **(Percentage of All Deaths)**	**65** **(13%)**	**426** **(85%)**	**11** **(2%)**	**502** **(100%)**

Source: *Crane Related Deaths in the U.S. Construction Industry, 1984-1994*.

A second study, *Crane Accidents 1997-1999: A Report of the Crane Unit of the Division of Occupational Safety and Health,* (Table 3) was prepared by the California Division of Occupational Safety and Health, Department of Industrial Relations. From January 1, 1997, through December 31, 1999, the Division of Occupational Safety and Health learned of, or had reported to it, a total of 158 incidents involving cranes. Of the 158 crane incidents in this study, 115 (73 percent) were attributed to mobile cranes. The 158 incidents resulted in 13 fatalities and 102 non-fatal injuries. Crane operators comprised only one fatality in this study, and non-crane operators totaled 12 fatalities as a result of a crane mishap. Additionally, of the 102 non-fatal injuries attributed to a crane incident, only 23 happened to the actual crane operator, with the majority of injuries affecting non-crane operators, including occupations such as mechanics, oilers, ironworkers, riggers, and stevedores. Of the 158 crane incidents, 8 involved public sector entities and 150 incidents involved private sector entities. Seven of the eight public sector crane incidents resulted in serious injury, and all eight involved a mobile crane.

Table 3

Accidents by Crane Types
1997-1999

	All Crane Types	Mobile Cranes	All Cranes per Year	Mobile Cranes per Year
Instability	67	49*	22.3	16.3
Unsecured Load	34	6	11.3	2
Load Capacity Exceeded	0	29	0	9.7
Ground not Level/Too Soft	0	4	0	1.3
Lack of Communication	32	24	10.6	8
Electrical Contact	13	10	4.3	3.3
Misc. in 14 Categories	46	32	15.3	10.7

Source: Crane Accidents 1997-1999: A Report of the Crane Unit of the Division of Occupational Safety and Health.

* This figure may include other types of instability that are not enumerated in this table.

Cranes are large pieces of construction equipment that are frequently utilized in congested urban environments. A crane accident, especially dealing with a crane overturning, could injure or effect individuals within a proximate distance limited only by the length and size of the crane and boom, as evidenced by the T-Rex crane accident. Data indicates that the individuals most likely to be endangered by crane accidents are not the crane operators themselves, but rather other workers on the construction sites.

Need for Regulation

The second sunrise criterion asks:

> Whether the public needs, and can reasonably be expected to benefit from, an assurance of initial and continuing professional or occupational competence.

It is certainly arguable that the operation of increasingly technical and mechanically sophisticated crane equipment requires an operator workforce that has adequate training and knowledge to operate the equipment with a high level of skill and safety. Consequently, the certification requirement, in and of itself, is a positive step in ensuring that crane operators have the knowledge and skills necessary to perform their job duties without endangering the general public, other workers, or themselves.

Competency based regulations focus on ensuring that practitioners of an occupation are at least minimally competent to practice that profession while providing a reasonable degree of safety to the general public. Based on the study performed in Ontario, Canada, it is reasonable to conclude that there could be some reduction of crane fatalities as a result the education and training provided for in this proposal. It is anticipated that mandatory crane operator training programs will elevate the degree of expertise of crane operators over the long run, therefore suggesting that the operation of cranes would be performed in a manner consistent with the continued protection of the health, safety, and welfare of the citizens of Colorado.

However, the regulatory scheme proposed by the Applicant does not include provisions for oversight of crane operators throughout the licensure period, making it more likely that this regulation will result in inadequate protection to the public, and consequently be unable to provide an assurance of continuing professional or occupational competence.

Of even greater importance, no evidence was submitted or discovered during the course of this review that indicates conclusively that any potential harm created by crane operation would be prevented or even lessened by the regulation of crane operators. The only study indicating that mandatory certification positively impacts crane safety may be misleading to policymakers and may draw unreliable conclusions relevant to this sunrise application.

Alternatives to Regulation

The third sunrise criterion asks:

> Whether the public can be adequately protected by other means in a more cost-effective manner.

Alternatives to the regulation of crane operators exist that afford either the same degree of protection to the public as the Applicant's sunrise proposal, or that would offer a more comprehensive and consistent regulatory approach.

On July 13, 2004, OSHA announced that the federal Cranes and Derricks Negotiated Rulemaking Advisory Committee (CDAC) had reached a consensus on language for a revised crane and derrick standard for construction. The draft was submitted to the Assistant Secretary of Labor for Occupational Safety and Health and has continued through the negotiated rulemaking process. OSHA is currently drafting the preamble, and then economic and cost-benefit analyses will take place, which will be followed by a review under the Small Business Regulatory Flexibility Act. There are other hurdles that the proposed rule revision must go through in the federal system. However, federal regulators at OSHA believe the revisions will become officially adopted within approximately two to three years. Federal officials have indicated that there will be a period of several years to gradually phase-in the revised standards.

The new proposed crane standards as they relate to crane operators is somewhat similar to the proposal submitted here by the Applicant, although there are some significant differences. Key provisions of the CDAC proposal include:

- Crane operators will be required to be certified by either: (1) a crane operator testing organization approved by a nationally recognized accrediting entity, or (2) an employer's own qualification program, which must be audited by a testing organization-approved auditor.
- The scope section covers a wide range of new types of cranes that have been developed over the past 30 years.
- Trainee certification criteria.
- Certification valid for five years.
- Licensing by a government entity.

Section 1427 of the federal CDAC proposed revised crane operator standard can be found in Appendix B on page 31. This is the only section of this document relating to crane operator certification standards and requirements. It should be noted that this section is only a small part of the CDAC consensus document that, in its entirety, consists of 41 sections and 119 pages. The majority of this document deals with other aspects of crane usage, such as assembly/disassembly, power line safety, and signal requirements. Section 1427 provides essentially the same requirements for crane operation certification as the sunrise proposal. Both proposed standards require testing and that testing be performed by an accredited testing entity that utilizes both written and practical testing. Currently, the only accredited testing entity, the NCCCO, requires a medical evaluation for fitness and clean substance abuse test results.

However, this federal program will not cost the State of Colorado anything as the costs and enforcement of the program would be the responsibility of the federal government through OSHA. While proponents of state regulation contend that there are many disadvantages to reliance on federal oversight, this approach is the most cost-effective approach for Colorado.

The OSHA proposal includes aspects of crane operator certification that are not included in the Applicant's proposal. Most notably, under section 1427(c), OSHA provides for an audited employer program to establish an employee's qualifications in lieu of the certification requirement. Although this evaluation is not necessarily performed by an independent testing entity, and, in fact, may be performed by the employer, there are stringent requirements and controls that are designed to prevent the employer or employee from circumventing the testing process.

A certified auditor, who is not an employee of the applicant's employer, will have unconditional oversight over every aspect of the testing process, including a mandatory determination that the written and practical tests meet nationally recognized test administration standards. The auditor must be certified to evaluate any testing by an accredited crane/derrick operator testing entity. Additionally, under this option, the employer program will be audited within three months of the beginning of the program and every three years thereafter. The employer program also must contain testing procedures for re-certification designed to ensure that the operator continues to meet the technical knowledge and skills requirements as set forth in the rules. This qualification is valid for a maximum of five years. However, this qualification is non-portable, as it is only valid when the employee is employed by, and working for, the employer that issued the qualification.

Conclusion

The Applicant has submitted evidence showing that the operation of cranes has the potential to harm or endanger the health, safety or welfare of the public, although there is no evidence that the potential harm would be prevented by state regulation. There are three reasonable and realistic approaches that should be considered in the regulation of crane operators.

The *first option* would be to maintain the current regulatory controls. This option would not require that new regulations or requirements be enacted regarding the operation of cranes in Colorado. This option would allow the current standards and federal regulations, American National Standards Institute/American Society of Mechanical Engineers, (ANSI/ASME B30.5-2000 and 29 Code of Federal Regulations (C.F.R.), section 1926.550) to remain in effect as the regulatory scheme for Colorado crane operators. There would not be mandatory testing, training, certification, or licensure at the present time. However, this option does not preclude future regulation by the federal government through OSHA. Of course, when the aforementioned proposed negotiated rulemaking becomes a national standard, OSHA will have full authority to enforce the standards against Colorado crane operators and crane operators across the United States. This is true regardless of which option is selected. This option would require that the state expend the least amount of funding as it would not require any additional source of revenue to continue with this current regulation.

The *second option* would be to endorse and codify the current proposal submitted by the Applicant, which is set forth in Senate Bill 05-219 (see Appendix A on page 24). This option would require that all Colorado crane operators acquire a certificate of competency from an accredited certifying entity, such as the National Commission for the Certification of Crane Operators (NCCCO). However, this option does not provide for any oversight of licensee conduct during the five-year period of certification.

This second option also provides for trainee supervision, recertification, exceptions to certification, and a maximum $1,000-administrative fine. This proposal places the enforcement of this regulation in DORA. This option requires a substantial, yet undetermined, amount of funding because items such as registration fees, legal services funding, administration and investigative expenses, and other sources of revenue or expenditures apparently have not been considered or addressed.

These first two options are very similar and fail to offer significant regulatory controls over crane operators. Both options merely require certification every five years, with little or no oversight of the licensees during that five-year period. Of these two options, the first would not entail any monetary expenditure, and would continue with the current level of regulation until OSHA's proposed rule becomes effective. This is certainly a more cost effective choice than the second option, which would require a state-run licensing entity (either a board, program, or advisory committee), and would necessarily generate substantial expenditures related to administrative services for the regulatory licensure process.

The *third option* entails a regulatory scheme that provides for enforcement provisions consistent with current Colorado agency regulations traditionally utilized by DORA boards and programs. This option provides for items that are not found in the other options, to wit:

- Licensure endorsement;
- License renewal provisions;
- Grounds for discipline;
- Due process in disciplinary proceedings;
- Rulemaking authority;
- Investigative and subpoena authority; and,
- Legal Services involvement.

Although this option also provides for certification by an accredited entity, it is far more comprehensive and consequently more costly than the other two options. The Applicant has frequently indicated that the proposed OSHA standards, which were discussed earlier in this report, are problematic in that their regulatory plan is not *proactive but reactive*. The concern here is that OSHA will only investigate, cite, or discipline crane operators *after* an accident or complaint involving a crane, and that the proposed federal legislation has no provisions for regulation of crane operators other than certification/licensure. This is an accurate portrayal of not only the federal proposal, but is also accurate in regards to the Applicant's proposed legislation here in Colorado (second option). The second option simply does not provide for a crane investigator who will actively venture to crane sites statewide to ascertain the licensure status of individual crane operators.

The threshold question that must be answered by a sunrise review, through an examination of the evidence, is whether an unregulated occupation causes or has the potential to harm the public. If that question is answered affirmatively, the review examines whether state regulation is likely to mitigate that harm. Finally, if regulation can be expected to provide improved safety to Colorado citizens, the review seeks to determine if there is a more cost effective approach than increasing the size and scope of Colorado state government.

In the instant case, the Applicant has demonstrated that there is at least a potential for harm from the operation of cranes. The evidence submitted by the Applicant shows a pattern of harm to other workers on a construction site and to the property of a construction company, crane operator, or adjacent properties. As this review points out, one 10-year study by OSHA reported approximately 50 crane-related fatalities per year nationwide.

However, the evidence fails to conclusively establish that the public will benefit from initial and continuing competency oversight by the state. Some level of accidents, regardless of operator skill and knowledge, are a risk inherent in this aspect of the construction industry. Furthermore, little evidence appears to exist nationally that demonstrates a relationship between certification and a reduction of crane accidents. If such studies were available in states that require certification, one could make more informed conclusions about the effect of state regulations.

On the other hand, it is not possible to dismiss the value of education and training inherent in the certification process. In particular, the safety codes established by the American National Standards Institute/American Society of Mechanical Engineers establish a number of basic requirements that are substantially equivalent to those promoted by the Applicant, and with no cost to the citizens of Colorado.

The final sunrise criterion questions the existence of a more cost effective approach compared to state regulation. It is difficult to make an estimate of projected costs associated with a regulatory program without first knowing the approximate number of registrants, and the degree of regulatory oversight required by the specific legislation. However, other states have basic monetary budgets in place that relate to an established regulatory program. Although the costs associated with a start-up regulatory program in Colorado might be different, Montana has allocated $105,638 for its 2006 crane regulatory program and New Mexico estimates that the total operating expenditures for its crane regulatory program for 2005 will be $125,626.

The Montana figures are entwined in several other regulated occupations and therefore might not reflect the total amount of expenses. Consequently, the numbers are not broken down with any specificity. The New Mexico figures include expenses relating to items such as vehicles, gas and oil, communications, field supplies, training, meals and lodging, office supplies and postage.

Regardless of the cost of new state regulations, Colorado does have the no-cost option of enhanced federal oversight. Although at least several years to adoption and implementation, the new OSHA standards have the benefit of being the product of a negotiated process within industry, and, importantly, contain many, if not all, of the provisions sought by the sunrise Applicant.

Recommendation – Do not create a licensing program to regulate crane operators.

The Colorado General Assembly should not impose state regulation on crane operators.

Although this sunrise report suggests that crane operation has the potential to endanger the health, welfare, and safety of the citizens of Colorado, there is no definitive or conclusive evidence demonstrating that crane certification reduces the number of accidents in the crane or construction industries.

The only study or report that reflected on this issue was prepared in Ontario, Canada (see Appendix C on page 38), and was conducted comparing data from the nine years preceding 1979 (1969-1978), and the 21 years following 1978 (1979-2002). This study limited it's analysis to a comparison of data generated by fatality rates, and did not consider or address the issue of crane accident or injury rates. The study noted that almost one-half of the fatalities occurred due to crane contact with electrical powerlines, and that only seven percent of the fatalities between 1969 and 2002 occurred as a result of operator error. A decrease in the number of cranes contacting powerlines could easily explain a reduction in reported fatalities. The report fails to delineate whether the rate or number of fatalities related to operator error increased or decreased as a result of mandatory certification. Unfortunately, the report does not contain the necessary specificity to conclude that mandatory certification makes crane usage substantially safer. This, in effect, negates the importance of this report for the issues under consideration.

The federal regulations that are currently in effect contain many of the specifics set forth in the Applicant's proposal. The proposed federal regulations that are anticipated to come into effect within a few years, exceed the scope and the specifics that are in the current proposal, and do so at no cost to the citizens of Colorado,

Nonetheless, if the General Assembly decides to regulate crane operators in Colorado, it is recommended that the effective date of this requirement be set no sooner than July 1, 2008. The concern in the crane and construction industries is that an earlier effective date may have a greater financial effect on smaller crane businesses, and that a 2008-effective date would allow Colorado crane operators sufficient time to acquire certification, and hopefully avoid the problems that California experienced when that state's mandatory certification program became effective before most of that state's crane operators acquired certification.

Appendix A – Senate Bill 05-219

First Regular Session
Sixty-fifth General Assembly
STATE OF COLORADO

REENGROSSED
This Version Includes All Amendments Adopted in the House of Introduction

LLS NO. 05-0837.01 Kristen Forrestal **SENATE BILL 05-219**

SENATE SPONSORSHIP

Takis,

HOUSE SPONSORSHIP

Cerbo,

Senate Committees	**House Committees**
Business, Labor and Technology	

A BILL FOR AN ACT

CONCERNING THE REGULATION OF CRANE OPERATORS, AND, IN CONNECTION THEREWITH, ESTABLISHING EDUCATION, EXAMINATION, AND CERTIFICATION REQUIREMENTS THAT SHALL BE MET PRIOR TO OPERATING MOBILE, CRAWLER, AND TOWER CRANES.

Bill Summary

(Note: This summary applies to this bill as introduced and does not necessarily reflect any amendments that may be subsequently adopted.)

Prohibits a person from operating a crane or an employer from employing a person as a crane operator unless the person has passed a physical examination, a substance abuse test, a written examination, and a hands-on examination and has received certification from an accredited

SENATE 3rd Reading Unamended May 2, 2005

SENATE Amended 2nd Reading April 29, 2005

Shading denotes HOUSE amendment. Double underlining denotes SENATE amendment.
Capital letters indicate new material to be added to existing statute.
Dashes through the words indicate deletions from existing statute.

certifying entity. Defines an accredited certifying entity as an organization whose certification program is accredited by the national commission for certifying agencies. Requires crane operators to be recertified every 5 years. Allows crane operator trainees to operate a crane prior to certification under the direct supervision of a certified crane operator. Punishes violations with a fine up to $1,000.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. Title 12, Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW ARTICLE to read:

ARTICLE 67

Crane Operators

12-67-101. Mobile crane, crawler crane, and tower crane operator qualifications - certification - repeal. (1) A PERSON SHALL NOT OPERATE, AND AN EMPLOYER SHALL NOT EMPLOY OR OTHERWISE ALLOW A PERSON TO OPERATE, A MOBILE, CRAWLER, OR TOWER CRANE UNTIL SUCH PERSON HAS RECEIVED A VALID CERTIFICATE OF COMPETENCY FOR THE TYPE OF CRANE TO BE USED, ISSUED IN ACCORDANCE WITH THIS SECTION BY AN ACCREDITED CERTIFYING ENTITY. CERTIFICATES SHALL BE ISSUED ONLY TO PERSONS WHO PASS ALL OF THE FOLLOWING EXAMINATIONS AND TESTS:

(a) A PHYSICAL EXAMINATION THAT IS CONDUCTED BY A PHYSICIAN AND THAT INCLUDES, AT A MINIMUM, THE CRITERIA SPECIFIED IN THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) B30.5-2000 STANDARD, CHAPTER 5-3.1.2(a)(1-5, 7, 8), OR THE UNITED STATES DEPARTMENT OF TRANSPORTATION PHYSICAL EXAMINATION REQUIREMENTS CONTAINED IN 49 CFR 391.41 TO 391.49;

(b) A SUBSTANCE ABUSE TEST THAT MEETS A LEVEL OF TESTING CONSISTENT WITH THE STANDARD PRACTICE FOR THE INDUSTRY WHERE

THE CRANE IS IN USE AND THAT IS CONDUCTED BY A RECOGNIZED LABORATORY SERVICE;

(c) A WRITTEN EXAMINATION DEVELOPED, VALIDATED, AND ADMINISTERED IN ACCORDANCE WITH THE STANDARDS FOR EDUCATIONAL AND PSYCHOLOGICAL TESTING, PUBLISHED IN 1999 BY THE JOINT COMMITTEE OF THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION, THE AMERICAN PSYCHOLOGICAL ASSOCIATION, AND THE NATIONAL COUNCIL ON MEASUREMENT IN EDUCATION. THE EXAMINATION SHALL TEST THE KNOWLEDGE AND SKILLS IDENTIFIED AS NECESSARY FOR SAFE CRANE OPERATIONS AND SHALL, AT A MINIMUM, INCLUDE THE FOLLOWING:

(I) OPERATIONAL CHARACTERISTICS AND CONTROLS, INCLUDING CHARACTERISTIC AND PERFORMANCE QUESTIONS APPROPRIATE TO THE CRANE TYPE FOR WHICH THE QUALIFICATION IS SOUGHT;

(II) EMERGENCY CONTROL SKILLS, SUCH AS A RESPONSE TO FIRE, POWER LINE CONTACT, LOSS OF STABILITY, OR CONTROL MALFUNCTION;

(III) A DEMONSTRATION OF BASIC ARITHMETIC SKILLS NECESSARY FOR CRANE OPERATION AND THE ABILITY TO READ AND COMPREHEND THE CRANE MANUFACTURER'S OPERATION AND MAINTENANCE INSTRUCTION MATERIALS, INCLUDING LOAD CAPACITY INFORMATION FOR THE CRANE FOR WHICH CERTIFICATION IS SOUGHT; AND

(IV) KNOWLEDGE OF CHAPTERS 5-0 TO 5-3 OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS B30.5-2000 AND B30.5a-2000 ADDENDA TO THE STANDARD FOR MOBILE AND LOCOMOTIVE CRANES OR CHAPTERS 4-0 TO 4-3 OF THE ASME B30.3-1006 STANDARD FOR CONSTRUCTION TOWER CRANES, DEPENDING ON THE TYPE OF CRANE FOR WHICH CERTIFICATION IS SOUGHT.

(d) A HANDS-ON EXAMINATION TO DEMONSTRATE PROFICIENCY IN

OPERATING THE SPECIFIC TYPE OF CRANE FOR WHICH CERTIFICATION IS SOUGHT, WHICH AT A MINIMUM SHALL INCLUDE PRE-START AND POST-START INSPECTION, MANEUVERING SKILLS, SHUTDOWN, AND SECURING.

(2) AN ACCREDITED CERTIFYING ENTITY SHALL ISSUE A CERTIFICATE OF COMPETENCY, WHICH SHALL BE VALID FOR FIVE YEARS AFTER THE DATE OF ISSUANCE, TO OPERATORS WHO SUCCESSFULLY DEMONSTRATE THE QUALIFICATIONS SET FORTH IN THIS SECTION. FOR THE PURPOSES OF THIS SECTION, "ACCREDITED CERTIFYING ENTITY" MEANS ANY ORGANIZATION WHOSE CERTIFICATION PROGRAM IS ACCREDITED BY THE NATIONAL COMMISSION FOR CERTIFYING AGENCIES.

(3) CRANE OPERATORS SHALL RECERTIFY EVERY FIVE YEARS AND, TO OBTAIN RECERTIFICATION, SHALL BE REQUIRED TO MEET ALL OF THE QUALIFICATIONS SET FORTH IN SUBSECTION (1) OF THIS SECTION; EXCEPT THAT AN OPERATOR WHO HAS AT LEAST ONE THOUSAND HOURS OF DOCUMENTED EXPERIENCE OPERATING A SPECIFIC TYPE OF CRANE FOR WHICH CERTIFICATION IS SOUGHT DURING THE IMMEDIATELY PRECEDING CERTIFICATION PERIOD AND WHO MEETS THE PHYSICAL EXAMINATION, SUBSTANCE ABUSE TEST, AND WRITTEN EXAMINATION REQUIREMENTS OF SUBSECTION (1) OF THIS SECTION SHALL NOT BE REQUIRED TO TAKE THE HANDS-ON EXAMINATION REQUIRED BY PARAGRAPH (d) OF SUBSECTION (1) OF THIS SECTION.

(4) NOTWITHSTANDING SUBSECTION (1) OF THIS SECTION, A PERSON MAY OPERATE A MOBILE, CRAWLER, OR TOWER CRANE AS A TRAINEE UNDER THE DIRECT SUPERVISION OF A CRANE OPERATOR WHO POSSESSES A VALID CERTIFICATE OF COMPETENCY FOR THE TYPE OF CRANE OPERATED BY THE TRAINEE. FOR THE PURPOSES OF THIS SUBSECTION (4),

"DIRECT SUPERVISION" MEANS THAT THE SUPERVISING OPERATOR IS IN THE IMMEDIATE AREA OF THE TRAINEE AND IS ABLE TO SEE AND EFFECTIVELY COMMUNICATE WITH THE TRAINEE. WHEN PERFORMING DIRECT SUPERVISION, THE SUPERVISING OPERATOR SHALL HAVE NO DUTIES OTHER THAN TO OBSERVE THE OPERATION OF THE CRANE BY THE TRAINEE.

(5) (a) THIS SECTION IS REPEALED, EFFECTIVE JULY 1, 2015.

(b) PRIOR TO SUCH REPEAL, THE REGULATION OF CRANE OPERATORS SHALL BE REVIEWED AS SET FORTH IN SECTION 24-34-104, C.R.S.

12-67-102. Exceptions. (1) THIS ARTICLE SHALL NOT APPLY TO:

(a) AN OPERATOR OF A MOBILE CRANE THAT HAS A BOOM LENGTH OF LESS THAN TWENTY-FIVE FEET OR A MAXIMUM RATED LOAD CAPACITY OF LESS THAN FIFTEEN THOUSAND POUNDS;

(b) AN OPERATOR OF A CRANE WHO IS A MEMBER OF THE ARMED FORCES OF THE UNITED STATES AND WHO OPERATES A CRANE DURING THE COURSE OF MILITARY DUTY;

(c) AN EMPLOYEE OF A MUNICIPAL UTILITY OR A PUBLIC UTILITY UNDER THE JURISDICTION OF THE PUBLIC UTILITIES COMMISSION; ____

(d) AN EMPLOYEE OF A RAILROAD; OR

(e) A PERSON WHO IS OPERATING A CRANE ON HIS OR HER OWN PRIVATE PROPERTY.

(f) AN EMPLOYEE OF A MINING OPERATION OR EMPLOYEE OF AN INDEPENDENT CONTRACTOR OF A MINING OPERATION SUBJECT TO REGULATION BY THE FEDERAL MINE SAFETY AND HEALTH ADMINISTRATION OR ITS SUCCESSOR AGENCY.

12-67-103. Penalty. AN EMPLOYER OR PERSON OPERATING A CRANE WHO VIOLATES THE PROVISIONS OF THIS ARTICLE SHALL BE SUBJECT

TO AN ADMINISTRATIVE FINE NOT TO EXCEED ONE THOUSAND DOLLARS AND SHALL PAY ANY COURT COSTS. REVENUES COLLECTED THROUGH THE ASSESSMENT OF ADMINISTRATIVE FINES SHALL BE TRANSMITTED TO THE STATE TREASURER, WHO SHALL CREDIT THE SAME TO THE DIVISION OF REGISTRATIONS CASH FUND.

12-67-104. Enforcement. (1) THE PROVISIONS OF THIS ARTICLE SHALL BE ENFORCED BY THE DEPARTMENT OF REGULATORY AGENCIES.

(2) THE DEPARTMENT OF REGULATORY AGENCIES SHALL INCLUDE IN THE SUNRISE REPORT SUBMITTED TO THE GENERAL ASSEMBLY ON OR BEFORE OCTOBER 15, 2005, PURSUANT TO SECTION 24-34-104.1, A PLAN OF ENFORCEMENT PURSUANT TO THIS ARTICLE 67. THE PLAN MAY INCLUDE A FEE CHARGED TO CERTIFIED CRANE OPERATORS TO PAY ANY COSTS ASSOCIATED WITH CERTIFICATION AND ENFORCEMENT. ANY FEE SHALL BE SET SO THAT THE AMOUNT OF MONEY COLLECTED SHALL NOT EXCEED SUCH COSTS.

SECTION 2. 24-34-104 (46), Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW PARAGRAPH to read:

24-34-104. General assembly review of regulatory agencies and functions for termination, continuation, or reestablishment. (46) The following agencies, functions, or both, shall terminate on July 1, 2015:

(d) THE REGULATION OF CRANE OPERATORS PURSUANT TO ARTICLE 67 OF TITLE 12, C.R.S.

SECTION 3. Effective date. (1) This act shall take effect January 1, 2007; except that section 12-67-104 (2) shall take effect upon passage.

(2) However, if a referendum petition is filed against this act or an item, section, or part of this act during the 90-day period after final

adjournment of the general assembly that is allowed for submitting a referendum petition pursuant to article V, section 1 (3) of the state constitution, then the act, item, section, or part, shall not take effect unless approved by the people at a biennial regular general election and shall take effect on the date specified in subsection (1) or on the date of the official declaration of the vote thereon by proclamation of the governor, whichever is later.

Appendix B – Cranes and Derricks Negotiated Rulemaking Advisory Committee's Proposed Standard for Crane Operators

1427 Operator qualification and certification.

(a) The employer must ensure that, prior to operating any equipment covered under Section 1400, the operator is either qualified or certified to operate the equipment in accordance with one of the Options in paragraphs (b) – (e), or is operating the equipment during a training period in accordance with paragraph (f).

(b) *Option (1)*: *Certification by an accredited crane/derrick operator testing organization.*

(1) For a testing organization to be considered accredited to certify operators under this Subpart, it must:

(i) Be accredited by a nationally recognized accrediting agency based on that agency's determination that industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel have been met.

(ii) Administer written and practical tests that:

(A) Assess the operator applicant regarding, at a minimum, the knowledge and skills listed in (j)(1) and (2).

(B) Provide different levels of certification based on equipment capacity and type.

(iii) Have procedures for operators to re-apply and be re-tested in the event an operator applicant fails a test or is decertified.

(iv) Have testing procedures for re-certification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in (j)(1) and (2).

(v) Have its accreditation reviewed by the nationally recognized accrediting agency at least every three years.

(2) A certification issued under this Option is portable.

(3) A certification issued under this paragraph is valid for 5 years.

(c) *Option (3): Qualification by an audited employer program.* The employer's qualification of its employee shall meet the following requirements:

(1) The written and practical tests shall be either:

(i) Developed by an accredited crane/derrick operator testing organization (see paragraph (b)), or

(ii) Approved by an auditor in accordance with the following requirements:

(A) The auditor is certified to evaluate such tests by an accredited crane/derrick operator testing organization (see paragraph (b)).

(B) The auditor is not an employee of the employer.

(C) The approval shall be based on the auditor's determination that the written and practical tests meet nationally recognized test development criteria and are valid and reliable in assessing the operator applicants regarding, at a minimum, the knowledge and skills listed in (j)(1) and (2).

(2) *Administration of tests.*

(i) The written and practical tests shall be administered under circumstances approved by the auditor as meeting nationally recognized test administration standards.

(ii) The auditor shall be certified to evaluate the administration of the written and practical tests by an accredited crane/derrick operator testing organization (see paragraph (b)).

(iii) The auditor shall not be an employee of the employer.

(iv) The audit shall be conducted in accordance with nationally recognized auditing standards.

(3) The employer program shall be audited within 3 months of the beginning of the program and every 3 years thereafter.

(4) The employer program shall have testing procedures for re-certification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in (j)(1) and (2). The re-certification procedures shall be audited in accordance with paragraph (c)(1) and (2).

(5) *Deficiencies.* If the auditor determines that there is a significant deficiency ("deficiency") in the program, the employer shall ensure that:

(i) No operator is qualified until the auditor confirms that the deficiency has been corrected.

(ii) The program is audited again within 180 days of the confirmation that the deficiency was corrected.

(iii) The auditor files a documented report of the deficiency to the appropriate Regional Office of the Occupational Safety and Health Administration within 15 days of the auditor's determination that there is a deficiency.

(iv) Records of the audits of the employer's program are maintained by the auditor for three years and are made available by the auditor to the Secretary of Labor or her designated representative upon request.

(6) A qualification under this paragraph is:

(i) Not portable.

(ii) Valid for 5 years.

(d) *Option (4). Qualification by the U.S. military.*

(1) For purposes of this Section, an operator is considered qualified if he/she has a current operator qualification issued by the U.S. military for operation of the equipment.

(2) A qualification under this paragraph is:

(i) Not portable.

(ii) Valid for the period of time stipulated by the issuing entity.

(e) *Option (5). Licensing by a government entity.*

(1) For purposes of this Section, a government licensing department/office that issues operator licenses for operating equipment covered by this standard is considered a government accredited crane/derrick operator testing organization if the criteria in paragraph (e)(2) are met.

(2) *Licensing criteria.*

(i) The requirements for obtaining the license include an assessment, by written and practical tests, of the operator applicant regarding, at a minimum, the knowledge and skills listed in (j)(1) and (2).

(ii) The testing meets industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel.

(iii) The government authority that oversees the licensing department/office, has determined that the requirements in paragraphs (e)(2)(i) and (ii) have been met.

(iv) The licensing department/office has testing procedures for re-certification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in (j)(1) and (2).

(3) A license issued by a government accredited crane/derrick operator testing organization that meets the requirements of this Option:

(i) Meets the operator qualification requirements of this Section for operation of equipment only within the jurisdiction of the government entity.

(ii) Is valid for the period of time stipulated by the licensing department/office, but no longer than 5 years.

(f) *Pre-qualification/certification training period.*

(1) An employee who is not qualified or certified under this Section is permitted to operate equipment where the requirements of paragraph (f)(2) are met.

(2) An employee who has passed neither the written nor practical tests required under this Section is permitted to operate equipment as part of his/her training where the following requirements are met:

(i) The employee ("trainee/apprentice") shall be provided with sufficient training prior to operating the equipment to enable the trainee to operate the equipment safely under limitations established by this Section (including continuous supervision) and any additional limitations established by the employer.

(ii) The tasks performed by the trainee/apprentice while operating the equipment shall be within the trainee's ability.

(iii) *Supervisor*. While operating the equipment, the trainee/apprentice shall be continuously supervised by an individual ("operator's supervisor") who meets the following requirements:

(A) The operator's supervisor is an employee or agent of the trainee's/apprentice's employer.

(B) The operator's supervisor is either a certified operator under this Section, or has passed the written portion of a certification test under one of the Options in paragraphs (b) - (e), and is familiar with the proper use of the equipment's controls.

(C) While supervising the trainee/apprentice, the operator's supervisor performs no tasks that detract from the supervisor's ability to supervise the trainee/apprentice.

(D) For equipment other than tower cranes: the operator's supervisor and the trainee/apprentice shall be in direct line of sight of each other. In addition, they shall communicate verbally or by hand signals. For tower cranes: the operator's supervisor and the trainee/apprentice shall be in direct communication with each other.

(iv) *Continuous supervision.* The trainee/apprentice shall be supervised by the operator's supervisor at all times, except for short breaks where the following are met:

(A) The break lasts no longer than 15 minutes and there is no more than one break per hour.

(B) Immediately prior to the break the operator's supervisor informs the trainee/apprentice of the specific tasks that the trainee/apprentice is to perform and limitations that he/she is to adhere to during the operator supervisor's break.

(C) The specific tasks that the trainee/apprentice will perform during the operator supervisor's break are within the trainee's/apprentice's abilities.

(v) The trainee/apprentice shall not operate the equipment in any of the following circumstances:

(A) If any part of the crane, load line or load (including rigging and lifting accessories), if operated up to the crane's maximum working radius in the work zone (see paragraph 1408(a)(1)), could get within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV.

(B) If the equipment is used to hoist personnel.

(C) In multiple-crane lifts.

(D) If the equipment is used over a shaft, cofferdam, or in a tank farm.

(E) For multiple-lift rigging, except where the operator's supervisor determines that the trainee's/apprentice's skills are sufficient for this high-skill work.

(g) Under this Section, a testing entity is permitted to provide training as well as testing services as long as the criteria of the applicable accrediting agency (in the Option selected) for an organization providing both services are met.

(h) Written tests under this Section are permitted to be administered verbally, with answers given verbally, where the operator candidate:

(1) Passes a written demonstration of literacy relevant to the work.

(2) Demonstrates the ability to use the type of written manufacturer procedures applicable to the class/type of equipment for which the candidate is seeking certification.

(i) [Reserved].

(j) *Certification criteria.* Qualifications and certifications must be based, at a minimum, on the following:

(1) A determination through a written test that:

(i) The individual knows the information necessary for safe operation of the specific type of equipment the individual will operate, including the following:

(A) The controls and operational/performance characteristics.

(B) Use of, and the ability to calculate (manually or with a calculator), load/capacity information on a variety of configurations of the equipment.

(C) Procedures for preventing and responding to power line contact.

(D) Technical knowledge similar to the subject matter criteria listed in Appendix Q applicable to the specific type of equipment the individual will operate. Use of the Appendix Q criteria meets the requirements of this provision.

(E) Technical knowledge applicable to:

(1) The suitability of the supporting ground and surface to handle expected loads.

(2) Site hazards.

(3) Site access.

(D) This Subpart, including applicable incorporated materials.

(ii) The individual is able to read and locate relevant information in the equipment manual and other materials containing information referred to in paragraph (j)(1)(i).

(2) A determination through a practical test that the individual has the skills necessary for safe operation of the equipment, including the following:

(i) Ability to recognize, from visual and audible observation, the items listed in section 1412(d) (shift inspection).

(ii) Operational and maneuvering skills.

(iii) Application of load chart information.

(iv) Application of safe shut-down and securing procedures.

(k) *Phase-in.*

(1) As of the effective date of this standard, until four years after the effective date of the standard, the following requirements apply:

(i) Operators of equipment covered by this standard are required to be competent to operate the equipment safely.

(ii) Where an employee assigned to operate machinery does not have the required knowledge or ability to operate the equipment safely, the employee shall be provided with the necessary training prior to operating the equipment. The employer shall ensure that the operator is evaluated to confirm that he/she understands the information provided in the training.

(2) The effective date of paragraphs (a) – (j) and (m) is [4 years after the effective date of the standard].

(l) [Reserved].

(m) *Definitions.*

(1) *"Portable."* Any employer of an operator with a certification that is portable under this Section meets the requirements of paragraph (a) with respect to that operator.

(2) "*Not portable.*" Where an operator has a qualification that is not portable under this Section, the qualification meets the requirements of paragraph (a) only where the operator is employed by (and operating the equipment for) the employer that issued the qualification.

Appendix C - Province of Ontario – Mobile Crane Fatalities

PROVINCE OF ONTARIO

CONSTRUCTION INDUSTRY

MOBILE CRANE FATALITIES

34 YEARS (1969 - 2002)

CAUSE	NUMBER	%
POWERLINE CONTACT	53	43.8%
LOAD HANDLING	18	14.9%
RIGGING	16	13.2%
OVERLOAD	10	8.3%
OPERATOR ERROR · RAPID BREAKING (1) · TWO-BLOCKING (3) · DROPPED BOOM (1) · CRANE MISAPPLICATION (1) · CRANE OUT-OF-LEVEL (1) · GROUND FAILURE (1) · HOIST LINE NOT VERTICAL (1)	9	7.4%
DISMANTLING BOOM	5	4.1%
WIRE ROPE FAILURE	5	4.1%
MISCELLANEOUS · SIGNAL MAN (1) · CONTACT POWER SOURCE (1) · STRUCK BY CRANE/CWT (3)	5	4.1%
TOTAL	121	100%