



# Oregon

John Kitzhaber MD, Governor

**Department of Consumer and Business Services**  
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July 25, 2014

[Text of Proposed Changes](#)

## Oregon OSHA – Proposed Changes to Confined Spaces Standard for General Industry and Construction

### ***Public Hearing Scheduled for:***

<u>Date</u>	<u>Time</u>	<u>Location</u>
August 25, 2014	10:00 am	Portland General Electric 4245 Kale Street NE Salem, OR 97305

In 2012, Oregon OSHA adopted OAR 437-002-0146. That rule was initiated to address confined space hazards for the construction industry, as the previous rule, OAR 437-002-1910.146, did not apply to the construction industry. The goal in this process was to draft a rule that was significantly less confusing than the current rule, address shortcomings with the current rule, and organize the standard so employers can better understand what is expected of them.

However, in September of 2013, Oregon OSHA received questions about certain provisions of the rule and their impacts on the industry, and we concluded there was enough substance to those concerns to justify reconvening a stakeholder group to address those concerns.

This rulemaking amends OAR 437-002-0146, Confined Spaces.

These amendments clarify employer obligations and eliminate confusing requirements.

Paragraph (2) Exceptions: The exception to these rules for excavation work was revised to reflect that these rules only apply in situations where employees can bodily enter sewer spaces.

Paragraph (3) Definitions: Several definitions were added and/or modified for clarity, including:

- Alternate entry
- Blanking or blinding
- Continuous system
- Control or controlling
- Double block and bleed
- Hazard control
- Hazard elimination
- Isolate or isolation
- Rescue
- Simulated Permit-Required Confined Space
- Ventilate or ventilation

Paragraph (4) Evaluation: Language clarifications were made in the responsibility to evaluate confined spaces. For example, employers with mobile workers must evaluate the areas where their employees are working, not the entire site.

Paragraphs (5) and (6): Language clarifications were made in the permit space entry program and permit entry process. For example, entry permits has a number of items that must be included in the permit. These items were removed from (5) Permit-Required Confined Space Entry Program and Permits and added to (6) Permit Entry.

Paragraph (9) Rescue: The requirements for rescue were re-organized; redundancy in non-entry, entry and third-party first aid and CPR training requirements were removed, and language clarifications were made.

The requirement for a written agreement between an employer and a third-party rescue service provider was removed.

Removed the ambiguity of whether a permit is required when an activated third-party rescue service provider performs a rescue.

The requirement for rescuers to be trained in first aid and CPR was changed to knowledgeable in first aid and CPR. The requirement for one member to be certified in both was not changed.

The requirement for practice rescues was changed from annually to prior to an entry and within 12 months before an entry.

The term "self-rescue" was removed from the rule, except in a note that was added to clarify that self-rescue is not a viable rescue option.

The redundant paragraph for third-party rescue providers was removed.

Paragraph (10) Alternate Entry: The exception for continuous systems was modified to allow for alternate entry when engulfment cannot occur.

A note was added that when fall hazards have been addressed and all other physical hazards eliminated and all atmospheric hazards have been eliminated or controlled with continuous ventilation, alternate entry is allowed.

Clarification language was added to specify who is authorized to allow alternate entry.

The documentation of the direct reading instrument calibration date was removed.

Paragraph (11) Training: The requirements for training were reorganized for clarity.

A note was added for awareness training to clarify when employees need awareness training.

Appendices: Language in the appendices was modified for clarification.

The sample permits were replaced with a new sample permit and a sample alternate entry form.

***When does this happen:*** Adoption tentatively will be September 2014

***To get a copy:*** Our web site – [www.orosha.org](http://www.orosha.org) Rules, then Proposed Rules  
Or call the Oregon OSHA Resource Center at 503-947-7453

***To comment:*** Department of Consumer and Business Services/Oregon OSHA  
350 Winter Street NE  
Salem OR 97301-3882  
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***Comment period closes:*** September 5, 2014

***Oregon OSHA contact:*** Dave McLaughlin, Central Office @ 503-947-7457;  
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Note: In compliance with the Americans with Disabilities Act (ADA), this publication is available in alternative formats by calling 503-378-3272.

Secretary of State  
**NOTICE OF PROPOSED RULEMAKING HEARING\***

A Statement of Need and Fiscal Impact accompanies this form.

Department of Consumer and Business Services/Oregon OSHA  
Agency and Division

OAR 437  
Administrative Rules Chapter Number

Sue Joye                      350 Winter Street NE Salem OR 97301-3882  
Rules Coordinator                      Address

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**RULE CAPTION**

Adopt amendments to Confined Spaces standard for general industry and construction.

August 25, 2014

10:00 am

Portland General Electric  
4245 Kale Street NE  
Salem, OR 97305

Hearing Date

Time

Location

Sue Joye  
Hearings Officer

*Auxiliary aids for persons with disabilities are available upon advance request.*

**RULEMAKING ACTION**

**AMEND:** OAR 437-002-0146

ORS 654.025(2) and 656.726(4)

Stat. Auth.

Other Authority

ORS 654.001 through 654.295

Stats. Implemented

**RULE SUMMARY**

This rulemaking amends OAR 437-002-0146, Confined Spaces.

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## STATEMENT OF NEED AND FISCAL IMPACT

A Notice of Proposed Rulemaking Hearing or a Notice of Proposed Rulemaking accompanies this form.

Department of Consumer and Business Services/Oregon OSHA  
Agency and Division

OAR 437  
Administrative Rules Chapter Number

**In the Matter of:**

Amending OAR 437-002-0146.

**Rule Caption:**

Adopt amendments to Confined Spaces standard for general industry and construction.

**Statutory Authority:** ORS 654.025(2) and 656.726(4)

**Stats. Implemented:** ORS 654.001 through 654.295

**Need for the Rule(s):**

In 2012, Oregon OSHA adopted OAR 437-002-0146. That rule was initiated to address confined space hazards for the construction industry, as the previous rule, OAR 437-002-1910.146, did not apply to the construction industry. The goal in this process was to draft a rule that was significantly less confusing than the current rule, addresses shortcomings with the current rule, and is laid out in a manner where employers can better understand what is expected of them.

However, in September of 2013, Oregon OSHA received questions about certain provisions of the rule and their impacts on the industry, and we concluded there was enough substance to those concerns to justify reconvening a stakeholder group to address those concerns.

**Documents Relied Upon, and where they are available:**

OAR 437-002-0146 Confined Spaces, in Division 2/J

[http://www.orosha.org/pdf/rules/division\\_2/div2\\_j.pdf](http://www.orosha.org/pdf/rules/division_2/div2_j.pdf)

Washington Administrative Code Chapter 296-809 (Confined Spaces)

<http://www.lni.wa.gov/wisha/rules/confinedspace/default.htm>

Federal Register / Vol. 72, No. 228 / Wednesday, November 28, 2007 (Proposed Rule for Confined Spaces in Construction)

[https://www.osha.gov/FedReg\\_oshapdf/FED20071128.pdf](https://www.osha.gov/FedReg_oshapdf/FED20071128.pdf)

ANSI /ASSE Z117.1-2003 (Safety Requirements for Confined Spaces). Available for viewing in the Oregon OSHA Resource Center, 350 Winter Street NE, Salem, OR 97301.

**Fiscal and Economic Impact, including Statement of Cost of Compliance:**

**Fiscal and Economic Impact:**

***\*\*Excerpts of the following text have also been used in other sections of this document.\*\****

In 2012, Oregon OSHA adopted a confined space rule (OAR 437-002-0146 Confined Spaces). The new rule replaced the previously adopted rule, which was the federal OSHA standard, 1910.146, Permit-Required Confined Spaces. The 1910.146 standard applied only to employers who fall within the Division 2, General Occupational Safety and Health rules. The 2012 rule expanded the scope of the rule to include employers who perform construction work inside confined spaces. After the 2012 adoption, stakeholders pointed out potential deficiencies in the initial economic impact document and raised other concerns about the rule as adopted. As a result, Oregon OSHA decided to replace the 2012 rule with a further revision to the rules. That further revision

is the subject of the current proposal. This analysis of the fiscal and economic impact replaces the analysis included in the 2012 rulemaking by considering the differences between the original federal rule and the current proposal. It also provides the required analysis of the differences between the 2012 rule and the current proposal. This analysis includes information provided by stakeholders who participated on the advisory committee that helped Oregon OSHA to develop the current proposal.

In discussions with stakeholders from the construction industry, they generally recognized that maintenance activities, even when performed by a construction company, can fall outside the regulatory definition of construction and therefore within the requirements of the federal rule. Some stakeholders from the construction industry also indicated that they perform work in other states (most notably the state of Washington) where comparable rules for confined spaces already apply to construction work. Many stakeholders from the construction industry also recognize the inherent danger of entering confined spaces and indicated that they follow the 1910.146 rule even when it does not explicitly apply to their scope of work.

Including the construction industry, the current rulemaking has the potential to affect approximately 127,000 employers in Oregon, based on the latest data from the Employment Department (Q4 of 2013). However, not every employer group will be affected equally.

For example, there are 5,700 employers in the manufacturing sector. There is a high probability that many of these employers have one or more permit-required confined spaces on their premises. On the other hand, there are approximately 13,400 employers in the retail sector. While some of these establishments may have permit-required confined spaces on their premises, the percentage of establishments that have these spaces will be much lower than manufacturing facilities, with the vast majority of such establishments having no confined spaces (and those that have spaces will be likely to have fewer, and less complicated, spaces). These industries were covered by the 1910.146 standard, and most of the requirements in the 2012 rule adoption were the same and would be retained in the current proposal. However, the 2012 standard included requirements for cataloging permit spaces, ensuring equipment is used according to the manufacturer's instructions, and providing awareness training, all of which would be retained in the current proposal. Therefore, this analysis considers the economic impact of these three provisions. The 2012 standard also required that arrangements with a third-party rescue provider be in writing. This proposal would eliminate that requirement. Therefore, this analysis does not include the economic impact of that provision.

There are approximately 12,000 employers engaged in construction activity in Oregon. This includes approximately 4,200 employers engaged in construction of buildings, both residential and commercial. There are approximately 900 employers in heavy construction, which includes highway construction, water and sewer system construction, and pipeline construction. There are also approximately 7,100 employers considered "specialty construction," which includes plumbing, electrical, cement precast, and roofing. Not all sectors within the construction industry are affected equally by this rulemaking (for example, roofers are unlikely to encounter confined spaces while those engaged in pipeline construction are more likely to encounter them). Federal OSHA, which has proposed permit-required confined space rule for construction activities, identifies multi-family residential construction as affected by confined space rulemaking. From at least 2001, Oregon has had fewer than 50 employers engaged primarily in multi-family residential construction. Based on the employment data, approximately 2,200 construction employers are more likely to be regularly affected by these rules.

#### **Differences between 2012 rule and this proposal.**

No new requirements were included in these revisions, and we therefore do not anticipate any net economic costs from this rulemaking. Compared to the 2012 rule, the proposed changes would be either economically neutral or represent a cost reduction.

The current standard requires mechanical ventilation to control hazardous atmospheres. The revised standard allows for the use of reliable natural airflow in lieu of or in addition to mechanical ventilation to control hazardous atmospheres.

The current standard requires annual practice for rescue personnel, even if an entry is not made during that 12-month period. The revised standard allows for practice rescues to be made prior to an entry or within 12 months of an entry.

The current standard requires that arrangements with a third-party rescue provider must be in writing. This proposal eliminates this requirement.

The current standard does not allow alternate entry into continuous systems unless the area to be entered could be isolated from the rest of the system, or all hazards are eliminated from the entire system. The revised standard adds another allowance to enter when engulfment cannot occur and ventilation in the area to be entered is sufficient to control atmospheric hazards.

**Costs for creating, revising, and administering a confined space program:**

There is a cost associated with revising an existing program, or creating a new program. There is also an initial training cost component to a confined space program. The amount of time necessary can vary widely, based on the complexity of the program, size of the employer, and the complexity of the permit spaces employees enter. Table 1 below gives a breakdown of the estimated amount of time that various tasks related to the administration of the confined space program. The timeframes below were provided by Associated General Contractors (AGC), Hoffman Construction, and the Eugene Water and Electric Board (EWEB). The EWEB timeframes include the added requirements from the 2012 rule adoption.

Table 1

Task	Construction		General Industry <sup>1</sup>
	Small <sup>2</sup>	Large	
Program Development	10 hours <sup>3</sup>	120 hours <sup>4</sup>	30 hours
Program Review	6 hours	(Included in number above)	5 hours
Supervisor Training (per employee) <sup>5</sup>	4 hours <sup>6</sup>	4 hours	1 hours
Affected Employee Training (per employee)	1.5 hours	1.5 hours	1 hour
Awareness Training (per employee)	0.1 hour	0.1 hour	0.5 hour
First aid training (per employee) <sup>7</sup>	4 hours	4 hours	4 hours

Table 2 lists the salaries (as recorded by the Oregon Employment Department) for several various occupations that may be included in the hours listed in table 1. The last column includes a presumption of loaded costs, which include “hidden” costs such as benefits, worker’s compensation insurance, vacation leave, and sick leave. All amounts are rounded to the nearest dollar.

Table 2

<sup>1</sup> Numbers based on data provided by Eugene Water and Electric Board (EWEB).

<sup>2</sup> Employers with 20 employees or less.

<sup>3</sup> Based on hiring a safety and health consultant to develop the program.

<sup>4</sup> This number is total time to develop and review a program and includes multi-tiered reviews which can be part of a large employers’ program. A multi-tiered program review is not specifically required by this standard.

<sup>5</sup> The construction training hours provided by AGC also includes recurring training, but the rule does not require re-training unless there is a change in the program or a problem.

<sup>6</sup> This is based on a 4-hour class provided by AGC; however, this particular class is not specifically required by this standard.

<sup>7</sup> The standard requires at least one member of a rescue team to be trained and certified in first aid and CPR. The total number of employees that need to be trained would be based on the total number of rescue teams the employer has.

<b>Occupation</b>	<b>2013 Average Hourly Salary</b>	<b>2013 90<sup>th</sup> Percentile Hourly Salary</b>	<b>2013 Average Hourly Salary + 100% Loading Cost</b>
Construction Manager Includes project managers and general superintendents	\$41	\$61	\$82
Construction Supervisors and Managers Employees who directly supervise and coordinate workers	\$29	\$44	\$58
Civil Engineers	\$39	\$55	\$78
Construction and Building Inspectors	\$30	\$41	\$60
Operating Engineers and Other Construction Equipment Operators	\$25	\$36	\$50
Excavating and Loading Machine Operators	\$23	\$34	\$46
Plumbers, Pipefitters, and Steamfitters	\$31	\$44	\$62
Construction Laborers	\$18-\$20	\$27-\$28	\$36-\$40
Occupational Safety and Health Professionals	\$31	\$43	\$62
Electrical Engineers	\$45	\$67	\$90
Mechanical Engineers	\$40	\$57	\$80
General and Operations Managers	\$47	\$84	\$94
Training and Development Managers	\$43	\$59	\$86
Engineering Managers	\$65	\$89	\$130

All salary data from <http://www.qualityinfo.org/olmisj/OlmisZine?zineid=00000012>

AGC and Hoffman Construction provided economic impact information that projected loaded staff costs for managers and safety professionals at \$175 per hour, and \$100 for all other employees. No additional information was provided on how these costs were calculated. EWEB provided information that projected loaded staff costs for senior management at \$125 per hour, safety staff at \$85 per hour, and all other average employee costs at \$60. All staff costs were based on a loaded rate of 70%.

Information provided by AGC suggested that program development for small construction companies would most typically be handled by a private consultant at a rate of \$250 per hour. At 10 hours to develop a program, the cost would typically be \$2,500, with a review cost in time at \$492. Additional time-based programmatic costs are listed in table 3 below.<sup>8</sup>

<sup>8</sup> It should be noted that many employers have indicated that their existing program is fully or nearly compliant with the rule; in such cases, the decision to develop a complete new program would not necessarily be mandated by the rule. However, this analysis treats the entire cost as a new cost.

Table 3

Activity	Estimated average cost	
	Construction	General Industry
Program Development	Small Employer: \$2,992 Large Employer: \$7,440-\$9,840	\$1,860
Program Review	(included in the costs above)	\$310-\$650
Supervisor Training (per employee)	\$236-\$520	\$62-\$130
Affected Employee Training (per employee)	\$54-\$137	\$62-\$130
Awareness Training (per employee)	\$4-\$13	\$18-\$65
First Aid Training (per employee)	\$144-\$520 + \$50 class fee	\$144-\$520 + \$50 class fee

Most of these costs are non-recurring, with the exception of first aid, which is typically required every 2-3 years, based on the requirements of the program through which employees are certified. Employee retraining is only required when there is a change or employees demonstrate a lack of understanding of their duties.

#### **Rescue and operational costs.**

Specialized training is required for rescue personnel. While this has been required of all employers to whom the 1910.146 standard applied, these costs can be new to construction employers who never did work outside construction or who are facing an expansion in the need for trained rescue personnel. Every member of a rescue team must have an understanding of first aid and CPR, with one member of the team certified, as well as training in the methods they will use to remove entrants from a permit-required confined space in the event of an emergency. Rescue team members must also periodically perform training or mock rescue from the various types of confined spaces they may be called upon to perform a rescue, to ensure that any such rescue can be performed expeditiously and with minimal risk to the person(s) being rescued and the rescue team. The time involved in a practice rescue can vary, depending on the size and complexity of the space in question, as well as whether the practice is entry rescue or non-entry rescue. We anticipate that a practice non-entry rescue would take up to an hour, including time to set up, review equipment, review the rescue plan, and break-down. An entry rescue may take 2-4 hours to practice. The anticipated cost for non-entry practice rescue is \$36-\$62 per employee. The anticipated cost for entry rescue practice is up to \$144-\$248 per employee.

In circumstances where an employer elects to have a third party as their entry rescue team, the cost can be \$1000 per day or more.

This rule requires an attendant while a permit-required confined space is occupied. The duties of the attendant cannot interfere with their primary function of ensuring the safety of the entrant(s). The estimated hourly cost of an attendant is \$36-\$62 per employee.

### **Equipment costs.**

Part of the cost of compliance will be in equipment. If purchases are necessary, the following is a breakdown of equipment costs:

- A four-way gas meter can range from \$700-4,000.
- A single gas meter can range from \$200-\$800.
- Ventilation blowers can range from \$350-\$3,000.
- Additional hoses for blowers can range from \$100-\$1,500.
- A portable power generator can range from \$250-\$6,000.
- A tripod can range from \$900-\$1,500.
- A winch can range from \$650-\$6,000.
- A tripod-winch unit (purchased in lieu of individual tripod and winch) can range from \$2,500-\$7,500.
- A rescue manikin can range from \$800-\$1800.

Depending on factors such as use and durability, some equipment costs may be recurring as equipment is replaced.

### **Consumable Equipment Costs.**

Gas meter sensors need to be replaced periodically, typically annually to biannually, although some equipment manufacturers have sensors that can last up to four years. Replacement sensors can range from \$200-\$900.

A consumable cost associated with gas meters is the calibration gas. These can range from \$45-\$500, depending on the contents and size of the container. The frequency of replacement can vary widely, depending on how often it is used, the duration of use, the size of the container, and expiration dates.

A cost in time will be in equipment maintenance. Recurring maintenance can involve annual, monthly, weekly, or even daily maintenance, depending on the equipment used, the manufacturer's instructions, and the frequency of use by that employer. The duration of time such maintenance would require depends heavily on the tasks that need to be performed based on the equipment, as well as the amount of equipment maintained by the employer.

### **Total Costs – Small Construction Employer.**

Based on information collected by federal OSHA for their proposed confined space in construction rule (<http://www.regulations.gov/#!docketDetail;D=OSHA-2007-0026>), small construction employers (1-19 employees) annually had 6,521 jobs nationwide that involve work with confined spaces that would be classified as permit-required confined spaces. By extrapolating this data to Oregon, Oregon OSHA estimates that approximately 130 jobs annually would be affected by this rulemaking.

The financial impact of this rulemaking for a construction employer with 19 employees is estimated as follows:

#### **Non-recurring costs:**

(tasks that are only required to be done once or initially, and only repeated if there is a change)

<b><u>Task</u></b>	<b><u>Cost</u></b>
Program Development and Review:	\$2,992
Equipment Purchase:	\$3,950-\$24,600
Supervisor training:	\$472-\$1,040 (training for 2 supervisors)
<b>Total:</b>	<b>\$7,414-28,632</b>

**Recurring costs:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Frequency</u></b>
First-aid training:	\$194-\$570	Every 2 years
Replacement calibration gas:	\$45-\$500	Every 1-3 years
Replacement gas sensors:	\$800-\$3,600	Every 1-4 years (based on 4 sensors)
Non-entry rescue practice:	\$72-\$124	Annually or before an entry (based on two employees for one hour)
<b>Total:</b>	<b>\$1,111-\$4,794</b>	

**Costs per job:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Notes</u></b>
Initial evaluation and pre-entry activity:	\$188-\$240	Based on 2 hours of supervisor and employee time
Employee training:	\$270-\$685	Based on training 5 employees in confined space duties
Awareness training	\$76-\$247	Based on training 19 employees
Confined space attendant:	\$1,440-\$2,480	Based on a 5-day project
Non-entry rescue planning:	\$94-\$120	Based on entry supervisor and attendant time of 1 hour
Entry Rescue team:	\$5,000	Based on a 5-day project where non-entry rescue can't be used
<b>Total:</b>	<b>\$2,032-\$3,772 for non-entry rescue</b> <b>\$6,974-\$8,652 for entry rescue</b>	

The total cost to a small employer is summarized below.

Program implementation:	\$7,414-\$28,632.
Recurring costs:	\$1,111-\$4,794.
Per job cost:	\$2,032-\$3,772 for non-entry rescue. \$6,974-\$8,652 for entry rescue.

<b>Total Implementation Costs (per employer):</b>	<b>\$10,557-\$42,078</b>
<b>Total Ongoing Annual Costs (per employer):</b>	<b>\$382-\$4,509</b>
<b>Total Annual Cost for All Entries:</b>	<b>\$264,160-\$1,124,760</b>
<b>Average Annual Cost for All Entries (per employer):</b>	<b>\$120-\$511</b>

**Alternate Entry for Small Construction Employers.**

This rule also provides a means to enter a permit space without the full requirements of a permit entry program. The costs for alternate entry in the above scenario are shown as follows:

**Non-recurring costs:**

(tasks that are only required to be done once or initially, and only repeated if there is a change)

<b><u>Task</u></b>	<b><u>Cost</u></b>
Program Development and Review:	\$2,992
Equipment Purchase:	\$1,600-\$15,300 (without rescue-related equipment)
Supervisor training:	\$472-\$1,040 (training for 2 supervisors)
<b>Total:</b>	<b>\$5,064-\$19,332</b>

**Recurring costs:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Frequency</u></b>
Replacement calibration gas:	\$45-\$500	Every 1-3 years
Replacement gas sensors:	\$800-\$3,600	Every 1-4 years (based on 4 sensors)
<b>Total:</b>	<b>\$845-\$4,100</b>	

**Costs per job:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Notes</u></b>
Initial evaluation and pre-entry activity:	\$152-\$240	Based on 2 hours of supervisor and employee time
Employee training:	\$270-\$685	Based on training 5 employees in confined space duties
Awareness training	\$76-\$247	Based on training 19 employees
<b>Total:</b>	<b>\$498-\$1,172</b>	

The total cost to a small construction employer who uses alternate entry is summarized below.

Program implementation:	\$5,064-\$19,332.
Recurring costs:	\$845-\$4,100.
Per job cost:	\$498-\$1,172.

<b>Total Implementation Costs (per employer):</b>	<b>\$6,407-\$24,604</b>
<b>Total Ongoing Annual Costs (per employer):</b>	<b>\$295-\$4,100</b>
<b>Total Annual Cost for All Entries:</b>	<b>\$64,740-\$152,360</b>
<b>Average Annual Cost for All Entries (per employer):</b>	<b>\$29-\$69</b>

## **Total Costs – Large Construction Employer.**

Based on information collected by federal OSHA for the proposed confined space in construction rule (<http://www.regulations.gov/#!docketDetail;D=OSHA-2007-0026>), larger employers (20 employees and above) had 19,172 jobs nationwide that would involve work with confined spaces that would be classified as permit-required confined spaces. In Oregon, this extrapolates to approximately 383 jobs annually that would be affected by this rulemaking.

The financial impact of this rulemaking for a construction employer with 100 employees is shown as follows:

### **Non-recurring costs:**

(tasks that are only required to be done once or initially, and only repeated if there is a change)

<b><u>Task</u></b>	<b><u>Cost</u></b>
Program Development and Review:	\$7,440-\$9,840
Equipment Purchase:	\$11,850-\$73,800 (purchasing 3 of everything)
Supervisor training:	\$928-\$2,080 (training for 4 supervisors)
<b>Total:</b>	<b>\$20,218-\$85,720</b>

### **Recurring costs:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Frequency</u></b>
First-aid training:	\$388-\$1,140	Every 2 years
Replacement calibration gas:	\$45-\$500	Every 1-3 years
Replacement gas sensors:	\$2,400-\$14,400	Every 1-4 years
Non-entry rescue practice:	\$1,080-\$1,860	Annually or before an entry (15 employees)
<b>Total:</b>	<b>\$3,913-\$17,900</b>	

### **Costs per job:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Notes</u></b>
Initial evaluation and pre-entry activity:	\$476-\$736	Based on 2 hours of supervisor and employee time (5 employees)
Employee training:	\$810-\$2,055	Based on training 15 employees in confined space duties
Awareness training	\$400-\$1,300	Based on training 100 employees
Confined space attendant:	\$1,440-\$2,480	Based on a 5-day project
Non-entry rescue planning:	\$94-\$120	Based on entry supervisor and attendant time of 1 hour
Entry Rescue team:	\$5,000	Based on a 5-day project where non-entry rescue can't be used
<b>Total:</b>	<b>\$3,220-\$6,691 for non-entry rescue</b> <b>\$8,126-\$11,571 for entry rescue</b>	

The total cost to a large construction employer is summarized below.

Program implementation:	\$20,218-\$85,720.
Recurring costs:	\$3,913-\$17,900.
Per job cost:	\$3,220-\$6,691 when using non- entry rescue. \$8,126-\$11,571 when using entry rescue.

<b>Total Implementation Costs (per employer):</b>	<b>\$27,351-\$115,191</b>
<b>Total Ongoing Annual Costs (per employer):</b>	<b>\$1,889-\$17,330</b>
<b>Total Annual Cost for All Entries:</b>	<b>\$1,233,260-\$4,431,693</b>
<b>Average Annual Cost for All Entries (per employer):</b>	<b>\$560-\$2,014</b>

Stakeholders have informed Oregon OSHA on multiple occasions that many large construction contractors have already been following the provisions of the 1910.146 rule. Those provisions already include the equipment-related and first aid training costs, which reduce the total costs to **\$12,684-\$25,351**.

<b>Total Revised Implementation Costs (per employer):</b>	<b>\$12,684-\$25,351</b>
<b>Total Revised Ongoing Annual Costs (per employer):</b>	<b>\$1,080-\$1,860</b>

**Alternate Entry for Large Construction Employers.**

The costs for alternate entry in the above scenario are shown as follows:

**Non-recurring costs:**

(tasks that are only required to be done once or initially, and only repeated if there is a change)

<b><u>Task</u></b>	<b><u>Cost</u></b>
Program Development and Review:	\$7,440-\$9,720
Equipment Purchase:	\$4,800-\$45,900 (purchasing 3 of everything)
Supervisor training:	\$928-\$2,080 (training for 4 supervisors)
<b>Total:</b>	<b>\$13,168-\$57,700</b>

**Recurring costs:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Frequency</u></b>
Replacement calibration gas:	\$45-\$500	Every 1-3 years
Replacement gas sensors:	\$2,400-\$14,400	Every 1-4 years
<b>Total:</b>	<b>\$2,445-\$14,900</b>	

**Costs per job:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Notes</u></b>
Initial evaluation and pre-entry activity:	\$476-\$736	Based on 2 hours of supervisor and employee time (5 employees)
Employee training:	\$810-\$2,055	Based on training 15 employees in confined space duties
Awareness training	\$400-\$1,300	Based on training 100 employees
<b>Total:</b>	<b>\$1,686-\$4,091</b>	

The total cost to a large construction employer who uses alternate entry is summarized below.

Program implementation:	\$13,168-\$57,700.
Recurring costs:	\$2,445-\$14,900.
Per job cost:	\$1,686-\$4,091

<b>Total Implementation Costs (per employer) :</b>	<b>\$17,299-\$76,691</b>
<b>Total Ongoing Annual Costs (per employer):</b>	<b>\$615-\$14,900</b>
<b>Total Annual Cost for All Entries:</b>	<b>\$646,887-\$1,566,853</b>
<b>Average Annual Cost for All Entries (per employer):</b>	<b>\$294-\$712</b>

Stakeholders have informed Oregon OSHA on multiple occasions that many large construction contractors have already been following the provisions of the 1910.146 rule. Those provisions already include the equipment-related and first aid training costs, which also reduce the total first-year costs to **\$10,070-\$15,891** and eliminates the total annual costs.

**General Industry Employers.**

The total costs of this rulemaking for facilities that that fell within the scope of the general industry standard, 1910.146, are shown as follows:

**Small employer:**

<b><u>Task</u></b>	<b><u>Cost</u></b>
Updating program:	\$1,860
Program review:	\$310-\$650
Identifying and documenting permit spaces:	\$2,480 (based on 40 hours)
Awareness training:	\$360-\$1,300 (based on training 20 employees)

<b>Total Implementation Cost (per employer):</b>	<b>\$5,010-\$6,290</b>
<b>Total Ongoing Annual Costs (per employer):</b>	<b>\$0</b>

**Large employer:**

<b><u>Task</u></b>	<b><u>Cost</u></b>
Updating program:	\$1,860
Program review:	\$310-\$650
Identifying and documenting permit spaces:	\$4,960 (based on 80 hours)
Awareness training:	\$900-\$3,250 (based on training 50 employees)

<b>Total Implementation Cost (per employer):</b>	<b>\$8,030-\$10,720</b>
<b>Total Ongoing Annual Costs:</b>	<b>\$0</b>

These employers can also use the expanded alternate entry process, which allows employees to enter permit spaces without the full permit program, under circumstances that they could not follow under 1910.146, resulting in savings in both time and equipment.

**Conclusion.**

While these costs can seem large to an employer who does not have any, or only some, of the items and issues above, the stakeholders from the construction industry with whom we worked on these rules appeared united in their understanding that these rules are necessary and the associated costs are acceptable because the most common result of a problem within a confined space is at least one fatality. Indeed, the 2012 rule was the product of several years work with both the construction industry and other stakeholders, almost all of whom supported application of the essential confined spaces requirements to construction throughout the rule development process.

More than half of the fatalities that occur within confined spaces are would-be rescuers, so the ability to understand the conditions within a confined space and be able to rescue an entrant in a timely manner is vitally important and the fact that much of the rule's cost relates to rescue is consistent with that reality. In the last 10 years, there have been at least 47 incidents in the US involving incidents in confined spaces, with 70 employees directly affected, 40 of whom died from the incident. There is little reason to believe that the risks in Oregon are different in any fundamental fashion.

**Statement of Cost of Compliance:**

1. Impact on state agencies, units of local government and the public (ORS 183.335(2)(b)(E)):

Costs incurred by Oregon OSHA represent similar costs associated with the promulgation, implementation and administration of a rule.

All state agencies are affected by the rules in the sense that they are employers under the Oregon Safe Employment Act (OSEAct).

The public as a whole will be affected only to the degree that members of the public are employers and employees.

2. Cost of compliance effect on small business (ORS 183.336):
  - a. Estimate the number of small businesses and types of business and industries with small businesses subject to the rule:

Based on the generally accepted understanding that small businesses make up the majority of Oregon employers (typically 90%), this rule does have the potential to impact up to 107,000 small businesses in Oregon.

Any fiscal impact should affect large and small business the same proportionately.

b. Projected reporting, recordkeeping and other administrative activities required for compliance, including costs of professional services:

There is a cost associated with revising an existing program, or creating a new program. There is also an initial training cost component to a confined space program. The amount of time necessary can vary widely, based on the complexity of the program, size of the employer, and the complexity of the permit spaces employees enter.

Specialized training is required for rescue personnel. While this has been required of all employers to whom the 1910.146 standard applied, these costs can be new to construction employers who never did work outside construction or who are facing an expansion in the need for trained rescue personnel. Every member of a rescue team must have an understanding of first aid and CPR, with one member of the team certified, as well as training in the methods they will use to remove entrants from a permit-required confined space in the event of an emergency. Rescue team members must also periodically perform training or mock rescue from the various types of confined spaces they may be called upon to perform a rescue, to ensure that any such rescue can be performed expeditiously and with minimal risk to the person(s) being rescued and the rescue team. The time involved in a practice rescue can vary, depending on the size and complexity of the space in question, as well as whether the practice is entry rescue or non-entry rescue. We anticipate that a practice non-entry rescue would take up to an hour, including time to set up, review equipment, review the rescue plan, and break-down. An entry rescue may take 2-4 hours to practice. The anticipated cost for non-entry practice rescue is \$36-\$62 per employee. The anticipated cost for entry rescue practice is up to \$144-\$248 per employee.

In circumstances where an employer elects to have a third party as their entry rescue team, the cost can be \$1000 per day or more.

c. Equipment, supplies, labor and increased administration required for compliance:

Part of the cost of compliance will be in equipment. If purchases are necessary, the following is a breakdown of equipment costs:

- A four-way gas meter can range from \$700-4,000.
- A single gas meter can range from \$200-\$800.
- Ventilation blowers can range from \$350-\$3,000.
- Additional hoses for blowers can range from \$100-\$1,500.
- A portable power generator can range from \$250-\$6,000.
- A tripod can range from \$900-\$1,500.
- A winch can range from \$650-\$6,000.
- A tripod-winch unit (purchased in lieu of individual tripod and winch) can range from \$2,500-\$7,500.
- A rescue manikin can range from \$800-\$1800.

Depending on factors such as use and durability, some equipment costs may be recurring as equipment is replaced.

**Consumable Equipment Costs.**

Gas meter sensors need to be replaced periodically, typically annually to biannually, although some equipment manufacturers have sensors that can last up to four years. Replacement sensors can range from \$200-\$900.

A consumable cost associated with gas meters is the calibration gas. These can range from \$45-\$500, depending on the contents and size of the container. The frequency of replacement can vary widely, depending on how often it is used, the duration of use, the size of the container, and expiration dates.

A cost in time will be in equipment maintenance. Recurring maintenance can involve annual, monthly, weekly, or even daily maintenance, depending on the equipment used, the manufacturer’s instructions, and the frequency of use by that employer. The duration of time such maintenance would require depends heavily on the tasks that need to be performed based on the equipment, as well as the amount of equipment maintained by the employer.

**Total Costs – Small Construction Employer.**

Based on information collected by federal OSHA for their proposed confined space in construction rule (<http://www.regulations.gov/#!docketDetail;D=OSHA-2007-0026>), small construction employers (1-19 employees) annually had 6,521 jobs nationwide that involve work with confined spaces that would be classified as permit-required confined spaces. By extrapolating this data to Oregon, Oregon OSHA estimates that approximately 130 jobs annually would be affected by this rulemaking.

The financial impact of this rulemaking for a construction employer with 19 employees is estimated as follows:

**Non-recurring costs:**

(tasks that are only required to be done once or initially, and only repeated if there is a change)

<b><u>Task</u></b>	<b><u>Cost</u></b>
Program Development and Review:	\$2,992
Equipment Purchase:	\$3,950-\$24,600
Supervisor training:	\$472-\$1,040 (training for 2 supervisors)
<b>Total:</b>	<b>\$7,414-28,632</b>

**Recurring costs:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Frequency</u></b>
First-aid training:	\$194-\$570	Every 2 years
Replacement calibration gas:	\$45-\$500	Every 1-3 years
Replacement gas sensors:	\$800-\$3,600	Every 1-4 years (based on 4 sensors)
Non-entry rescue practice:	\$72-\$124	Annually or before an entry (based on two employees for one hour)
<b>Total:</b>	<b>\$1,111-\$4,794</b>	

**Costs per job:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Notes</u></b>
Initial evaluation and pre-entry activity:	\$188-\$240	Based on 2 hours of supervisor and employee time
Employee training:	\$270-\$685	Based on training 5 employees in confined space duties
Awareness training	\$76-\$247	Based on training 19 employees
Confined space attendant:	\$1,440-\$2,480	Based on a 5-day project
Non-entry rescue planning:	\$94-\$120	Based on entry supervisor and attendant time of 1 hour
Entry Rescue team:	\$5,000	Based on a 5-day project where non-entry rescue can't be used
<b>Total:</b>	<b>\$2,032-\$3,772 for non-entry rescue</b> <b>\$6,974-\$8,652 for entry rescue</b>	

The total cost to a small employer is summarized below.

Program implementation:	\$7,414-\$28,632.
Recurring costs:	\$1,111-\$4,794.
Per job cost:	\$2,032-\$3,772 for non-entry rescue. \$6,974-\$8,652 for entry rescue.

<b>Total Implementation Costs (per employer):</b>	<b>\$10,557-\$42,078</b>
<b>Total Ongoing Annual Costs (per employer):</b>	<b>\$382-\$4,509</b>
<b>Total Annual Cost for All Entries:</b>	<b>\$264,160-\$1,124,760</b>
<b>Average Annual Cost for All Entries (per employer):</b>	<b>\$120-\$511</b>

**Alternate Entry for Small Construction Employers.**

This rule also provides a means to enter a permit space without the full requirements of a permit entry program. The costs for alternate entry in the above scenario are shown as follows:

**Non-recurring costs:**

(tasks that are only required to be done once or initially, and only repeated if there is a change)

<b><u>Task</u></b>	<b><u>Cost</u></b>
Program Development and Review:	\$2,992
Equipment Purchase:	\$1,600-\$15,300 (without rescue-related equipment)
Supervisor training:	\$472-\$1,040 (training for 2 supervisors)
<b>Total:</b>	<b>\$5,064-\$19,332</b>

**Recurring costs:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Frequency</u></b>
Replacement calibration gas:	\$45-\$500	Every 1-3 years
Replacement gas sensors:	\$800-\$3,600	Every 1-4 years (based on 4 sensors)
<b>Total:</b>	<b>\$845-\$4,100</b>	

**Costs per job:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Notes</u></b>
Initial evaluation and pre-entry activity:	\$152-\$240	Based on 2 hours of supervisor and employee time
Employee training:	\$270-\$685	Based on training 5 employees in confined space duties
Awareness training	\$76-\$247	Based on training 19 employees
<b>Total:</b>	<b>\$498-\$1,172</b>	

The total cost to a small construction employer who uses alternate entry is summarized below.

Program implementation:	\$5,064-\$19,332.
Recurring costs:	\$845-\$4,100.
Per job cost:	\$498-\$1,172.

<b>Total Implementation Costs (per employer):</b>	<b>\$6,407-\$24,604</b>
<b>Total Ongoing Annual Costs (per employer):</b>	<b>\$295-\$4,100</b>
<b>Total Annual Cost for All Entries:</b>	<b>\$64,740-\$152,360</b>
<b>Average Annual Cost for All Entries (per employer):</b>	<b>\$29-\$69</b>

## **Total Costs – Large Construction Employer.**

Based on information collected by federal OSHA for the proposed confined space in construction rule (<http://www.regulations.gov/#!docketDetail;D=OSHA-2007-0026>), larger employers (20 employees and above) had 19,172 jobs nationwide that would involve work with confined spaces that would be classified as permit-required confined spaces. In Oregon, this extrapolates to approximately 383 jobs annually that would be affected by this rulemaking.

The financial impact of this rulemaking for a construction employer with 100 employees is shown as follows:

### **Non-recurring costs:**

(tasks that are only required to be done once or initially, and only repeated if there is a change)

<b><u>Task</u></b>	<b><u>Cost</u></b>
Program Development and Review:	\$7,440-\$9,840
Equipment Purchase:	\$11,850-\$73,800 (purchasing 3 of everything)
Supervisor training:	\$928-\$2,080 (training for 4 supervisors)
<b>Total:</b>	<b>\$20,218-\$85,720</b>

### **Recurring costs:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Frequency</u></b>
First-aid training:	\$388-\$1,140	Every 2 years
Replacement calibration gas:	\$45-\$500	Every 1-3 years
Replacement gas sensors:	\$2,400-\$14,400	Every 1-4 years
Non-entry rescue practice:	\$1,080-\$1,860	Annually or before an entry (15 employees)
<b>Total:</b>	<b>\$3,913-\$17,900</b>	

### **Costs per job:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Notes</u></b>
Initial evaluation and pre-entry activity:	\$476-\$736	Based on 2 hours of supervisor and employee time (5 employees)
Employee training:	\$810-\$2,055	Based on training 15 employees in confined space duties
Awareness training	\$400-\$1,300	Based on training 100 employees
Confined space attendant:	\$1,440-\$2,480	Based on a 5-day project
Non-entry rescue planning:	\$94-\$120	Based on entry supervisor and attendant time of 1 hour
Entry Rescue team:	\$5,000	Based on a 5-day project where non-entry rescue can't be used
<b>Total:</b>	<b>\$3,220-\$6,691 for non-entry rescue</b> <b>\$8,126-\$11,571 for entry rescue</b>	

The total cost to a large construction employer is summarized below.

Program implementation:	\$20,218-\$85,720.
Recurring costs:	\$3,913-\$17,900.
Per job cost:	\$3,220-\$6,691 when using non-entry rescue. \$8,126-\$11,571 when using entry rescue.

<b>Total Implementation Costs (per employer):</b>	<b>\$27,351-\$115,191</b>
<b>Total Ongoing Annual Costs (per employer):</b>	<b>\$1,889-\$17,330</b>
<b>Total Annual Cost for All Entries:</b>	<b>\$1,233,260-\$4,431,693</b>
<b>Average Annual Cost for All Entries (per employer):</b>	<b>\$560-\$2,014</b>

Stakeholders have informed Oregon OSHA on multiple occasions that many large construction contractors have already been following the provisions of the 1910.146 rule. Those provisions already include the equipment-related and first aid training costs, which reduce the total costs to **\$12,684-\$25,351**.

<b>Total Revised Implementation Costs (per employer):</b>	<b>\$12,684-\$25,351</b>
<b>Total Revised Ongoing Annual Costs (per employer):</b>	<b>\$1,080-\$1,860</b>

**Alternate Entry for Large Construction Employers.**

The costs for alternate entry in the above scenario are shown as follows:

**Non-recurring costs:**

(tasks that are only required to be done once or initially, and only repeated if there is a change)

<u>Task</u>	<u>Cost</u>
Program Development and Review:	\$7,440-\$9,720
Equipment Purchase:	\$4,800-\$45,900 (purchasing 3 of everything)
Supervisor training:	\$928-\$2,080 (training for 4 supervisors)
<b>Total:</b>	<b>\$13,168-\$57,700</b>

**Recurring costs:**

<u>Task</u>	<u>Cost</u>	<u>Frequency</u>
Replacement calibration gas:	\$45-\$500	Every 1-3 years
Replacement gas sensors:	\$2,400-\$14,400	Every 1-4 years
<b>Total:</b>	<b>\$2,445-\$14,900</b>	

**Costs per job:**

<b><u>Task</u></b>	<b><u>Cost</u></b>	<b><u>Notes</u></b>
Initial evaluation and pre-entry activity:	\$476-\$736	Based on 2 hours of supervisor and employee time (5 employees)
Employee training:	\$810-\$2,055	Based on training 15 employees in confined space duties
Awareness training	\$400-\$1,300	Based on training 100 employees
<b>Total:</b>	<b>\$1,686-\$4,091</b>	

The total cost to a large construction employer who uses alternate entry is summarized below.

Program implementation:	\$13,168-\$57,700.
Recurring costs:	\$2,445-\$14,900.
Per job cost:	\$1,686-\$4,091

<b>Total Implementation Costs (per employer) :</b>	<b>\$17,299-\$76,691</b>
<b>Total Ongoing Annual Costs (per employer):</b>	<b>\$615-\$14,900</b>
<b>Total Annual Cost for All Entries:</b>	<b>\$646,887-\$1,566,853</b>
<b>Average Annual Cost for All Entries (per employer):</b>	<b>\$294-\$712</b>

Stakeholders have informed Oregon OSHA on multiple occasions that many large construction contractors have already been following the provisions of the 1910.146 rule. Those provisions already include the equipment-related and first aid training costs, which also reduce the total first-year costs to **\$10,070-\$15,891** and eliminates the total annual costs.

**General Industry Employers.**

The total costs of this rulemaking for facilities that that fell within the scope of the general industry standard, 1910.146, are shown as follows:

**Small employer:**

<b><u>Task</u></b>	<b><u>Cost</u></b>
Updating program:	\$1,860
Program review:	\$310-\$650
Identifying and documenting permit spaces:	\$2,480 (based on 40 hours)
Awareness training:	\$360-\$1,300 (based on training 20 employees)

<b>Total Implementation Cost (per employer):</b>	<b>\$5,010-\$6,290</b>
<b>Total Ongoing Annual Costs (per employer):</b>	<b>\$0</b>

**Large employer:**

<u>Task</u>	<u>Cost</u>
Updating program:	\$1,860
Program review:	\$310-\$650
Identifying and documenting permit spaces:	\$4,960 (based on 80 hours)
Awareness training:	\$900-\$3,250 (based on training 50 employees)

<b>Total Implementation Cost (per employer):</b>	<b>\$8,030-\$10,720</b>
<b>Total Ongoing Annual Costs:</b>	<b>\$0</b>

These employers can also use the expanded alternate entry process, which allows employees to enter permit spaces without the full permit program, under circumstances that they could not follow under 1910.146, resulting in savings in both time and equipment.

**How were small businesses involved in the development of this rule?**

This rule was developed with a stakeholder group, with members from companies of a variety of sizes, as well as industry associations, including American General Contractors.

**Administrative Rule Advisory Committee consulted?**

**If not, why?**

Yes, this rule was initiated with a stakeholder group from the construction industry and general industry.

/s/Michael D. Wood

Authorized Signer

Printed name

7/15/2014

Date