



# PROPOSED RULE MAKING

## CR-102 (June 2012)

(Implements RCW 34.05.320)

Do NOT use for expedited rule making

**Agency:** Department of Labor & Industries

<input checked="" type="checkbox"/> Preproposal Statement of Inquiry was filed as WSR 13-06-055; or	<input checked="" type="checkbox"/> Original Notice
<input type="checkbox"/> Expedited Rule Making--Proposed notice was filed as WSR _____; or	<input type="checkbox"/> Supplemental Notice to WSR _____
<input type="checkbox"/> Proposal is exempt under RCW 34.05.310(4) or 34.05.330(1).	<input type="checkbox"/> Continuance of WSR _____

**Title of rule and other identifying information:**

Chapter 296-45 WAC Safety Standards for Electrical Workers – Rotorcraft/helicopter for power distribution and transmission line installation, construction and repair.

**Hearing location(s):**

See Attachment (1)

**Submit written comments to:**

Name: Cynthia Ireland  
Address: Post Office Box 44620, Olympia, WA 98504-4620  
e-mail [cynthia.ireland@lni.wa.gov](mailto:cynthia.ireland@lni.wa.gov)  
fax (360) 902-5619 by February 17, 2016

**Assistance for persons with disabilities:** Contact

Cynthia Ireland by January 11, 2016 at (360) 902-5522 or [cynthia.ireland@lni.wa.gov](mailto:cynthia.ireland@lni.wa.gov).

**Date of intended adoption:** April 4, 2016

(Note: This is NOT the effective date)

**Purpose of the proposal and its anticipated effects, including any changes in existing rules:**

In the spring of 2012, The Electrical Utility Safety Advisory Committee (EUSAC), a work group comprised of about fifty business and labor representatives, asked the department to commence rulemaking to update and clarify safety requirements that relate to electrical work being done with the assistance of helicopters. Some of the changes being proposed:

- Add language relating to certification requirements for helicopter service providers.
- Amend language to expand the scope of personnel to "all workers", and to specify that they must be "qualified and trained" to perform their assigned work tasks.
- Add language to address the requirement of hazard analysis and job briefings.
- Add language to address pilot fatigue.
- Sling and rigging requirements were updated to be able to perform new practices allowed by the proposed rule.

See Attachment (2).

**Reasons supporting proposal:**

The Occupational Safety and Health Administration (OSHA) also regulate helicopter safety. The department will coordinate with OSHA to ensure our rules are as effective as OSHA's. The Federal Aviation Administration also regulates helicopter safety; however the FAA's focus is on pilot safety and operation of the aircraft. The department's proposed rule primarily focuses on electrical workers who work on high voltage wires with the assistance of helicopters. The safety standards for electrical workers under Chapter 296-45 WAC with regard to helicopter-assisted power line work have not been updated for many years. Therefore, parts of them are outdated and do not reflect best industry practices, or are inconsistent with federal or state laws, or are inadequate to protect electrical workers.

**Statutory authority for adoption:**

RCW 49.17.010, RCW 49.17.040, RCW 49.17.050, RCW 49.17.060

**Statute being implemented:**

Chapter 49.17 RCW

**Is rule necessary because of a:**

Federal Law?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Federal Court Decision?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
State Court Decision?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

If yes, CITATION:

**DATE**

December 8, 2015

**NAME (type or print)**

Joel Sacks

**SIGNATURE**

**TITLE**

Director

**CODE REVISER USE ONLY**

OFFICE OF THE CODE REVISER  
STATE OF WASHINGTON  
FILED

**DATE: December 08, 2015**

**TIME: 12:11 PM**

**WSR 16-01-029**

**Agency comments or recommendations, if any, as to statutory language, implementation, enforcement, and fiscal matters:**

None

**Name of proponent:** Department of Labor and Industries

- Private
- Public
- Governmental

**Name of agency personnel responsible for:**

Name	Office Location	Phone
Drafting..... Chris Miller	Tumwater, WA	(360) 902-5516
Implementation.... Anne Soiza	Tumwater, WA	(360) 902-5090
Enforcement..... Anne Soiza	Tumwater, WA	(360) 902-5090

**Has a small business economic impact statement been prepared under chapter 19.85 RCW or has a school district fiscal impact statement been prepared under section 1, chapter 210, Laws of 2012?**

Yes. Attach copy of small business economic impact statement or school district fiscal impact statement.

A copy of the statement may be obtained by contacting:

Name: Cynthia Ireland  
Address: Post Office Box 44620, Olympia, WA 98504-4620  
phone (360) 902-5522  
fax (360) 902-5619  
e-mail cynthia.ireland@lni.wa.gov

No. Explain why no statement was prepared.

**Is a cost-benefit analysis required under RCW 34.05.328?**

Yes A preliminary cost-benefit analysis may be obtained by contacting:

Name: Cynthia Ireland  
Address: Post Office Box 44620, Olympia, WA 98504-4620  
phone (360) 902-5522  
fax (360) 902-5619  
e-mail cynthia.ireland@lni.wa.gov

No: Please explain:

**CR 102 RULE-MAKING ORDER (RCW 34.05.320)**

Department of Labor and Industries  
Division of Occupational Safety and Health  
CR-102 Filing Date: December 8, 2015  
Hearing Dates: January 26 and 27, February 1 and 3, 2016

**Attachment (1)**  
(Public Hearings)

---

---

**Public Hearings:**

**Date: January 26, 2016**                      **Time: 9:00 a.m.**  
Red Lion Hotel  
1225 North Wenatchee Avenue  
Wenatchee, Washington

**Date: January 27, 2016**                      **Time: 9:00 a.m.**  
Enduris Training Facility  
1610 South Technology Boulevard, Suite 100  
Spokane, Washington

**Date: February 1, 2016**                      **Time: 9:00 a.m.**  
The Heathman Lodge  
7801 Greenwood Drive  
Vancouver, Washington

**Date: February 3, 2016**                      **Time: 9:00 a.m.**  
Department Of Labor and Industries – S118 & S119 Rooms  
7273 Linderson Way Southwest  
Tumwater, Washington

**Submit written comments to:**

Cindy Ireland, Administrative Regulations Analyst ([Cynthia.Ireland@lni.wa.gov](mailto:Cynthia.Ireland@lni.wa.gov))  
Division of Occupational Safety and Health  
P.O. Box 44620  
Olympia, Washington 98504-4620                      By: 5:00 p.m. on February 17, 2016

In addition to written comments, the department will accept comments submitted to the following fax number: (360) 902-5619

Comments submitted by fax must be 10 pages or less.

**AMENDED SECTIONS:**

**WAC 296-45-67503 Definitions.**

- Remove numbers from each definition.
- Add definitions for helicopter service provider and pilot in command, pilot or PIC.

**WAC 296-45-67513 Personal protective equipment (PPE).**

- Subsection (2): Add an ANSI reference relating to hard hats and helmets.
- Subsection (3): Add language relating to performing and documenting a hazard assessment to determine appropriate PPE.

**WAC 296-45-67519 Housekeeping.**

- Change title of this section to "Landing zones".
- Subsection (1): Add language relating to establishing a landing zone.

**WAC 296-45-67521 Operator's responsibility.**

- Change title of this section to "Pilot's responsibility".
- Subsection (1): Add language relating to the pilot being properly rested and fit for duty.
- Replace "operator" with "pilot" throughout this section.
- Subsection (5): Add language relating to the pilot possessing the appropriate ratings for the aircraft and be competent to safely conduct assigned tasks.

**WAC 296-45-67523 Hooking and unhooking loads.**

- Subsections (1) through (3): Reworded language for clarity.

**WAC 296-45-67525 Static charge.**

- Revised language to include "bonded" as means to protect against static charge and removed rubber gloves.

**WAC 296-45-67527 Load permitted.**

- Change title of this section to "Line stringing".
- Subsections (2) and (3): Reworded for clarity.
- Subsection (4): Add language relating to a helicopter shall not pull any cable, rope or similar line which is at any point attached to a fixed object other than the helicopter itself.

**WAC 296-45-67529 Visibility.**

- Housekeeping change.

**WAC 296-45-67531 Signal systems.**

- Change title of this section to "Communication".
- Subsections (1) and (2): Reworded for clarity.
- Subsections (3) and (4): Move language from current WAC 296-45-67507 and reword for clarity.

**CR-102 RULE-MAKING ORDER (RCW 34.05.320)**

Department of Labor and Industries  
Division of Occupational Safety and Health  
CR-102 Filing Date: December 8, 2015  
Hearing Dates: January 26 and 27, February 1 and 3, 2016

**Attachment (2)**  
(Purpose Statement)

---

---

**WAC 296-45-67533 Approaching the helicopter.**

- Change title of this section to “Helicopter operation”.
- Subsections (2) through (12) are new but language is existing and considered current industry work practices. Merge this section with current WAC 296-45-67535.

**WAC 296-45-67537 Sling and rigging.**

- Subsection (1): Clarify language making it clear that rigging must be checked prior to using.
- Subsection (2): Add language requiring appropriate training.
- Subsection (3): Reword for clarity.
- Subsection (4): Add language from current WAC 296-45-67509.

**WAC 296-45-67545 Refueling operations.**

- Reword this section for clarity.
- Remove subsection (3)(h).

**NEW SECTIONS:**

**WAC 296-45-67504 Operating certification.**

- Add this section relating to operating certification requiring additional training.

**WAC 296-45-67506 Personnel.**

- Move this section from current WAC 296-45-67539 adding additional training requirements.

**WAC 296-45-67508 Hazard analysis and job briefing.**

- Add this section relating to hazard analysis and job briefings adding additional training requirements.

**WAC 296-45-67522 Cargo hooks.**

- Move this section from current WAC 296-45-67511 for better organization of information.

**WAC 296-45-67536 Helicopter work tasks.**

- Subsection (1): Add language relating to aerial hover transfer.
- Subsection (2): Reword language relating to human external cargo (HEC).
- Subsection (3): Add language relating to external cargo sling loads.

**REPEALED SECTIONS:**

**WAC 296-45-67505 Briefing.**

**WAC 296-45-67505 Signals.**

**WAC 296-45-67509 Slings and taglines.**

**WAC 296-45-67511 Cargo hooks.**

**WAC 296-45-67535 In helicopter.**

**WAC 296-45-67539 Personnel.**

**WAC 296-45-67543 General.**

**Small Business Economic Impact Statement for Rule  
Amendments to Section 296-45-675 WAC  
Rotorcraft/Helicopter for Power Distribution and  
Transmission Line Installation, Construction and Repair**

**Washington State Department of Labor and Industries**

**February, 2015**

# Table of Contents

<b>1. INTRODUCTION OF THE PROPOSED RULE</b> .....	<b>1</b>
1.1 THE BACKGROUND OF THIS RULEMAKING .....	1
1.2 THE DESCRIPTION OF THE RULE AMENDMENTS.....	2
<b>2. INTRODUCTION OF THE COST SURVEY</b> .....	<b>3</b>
2.1 SURVEY DEVELOPMENT AND SAMPLE SIZE .....	4
2.2 SURVEY CONTENTS AND RESPONSES .....	4
<b>3. ASSESSING ECONOMIC IMPACT BY EMPLOYMENT SIZE</b> .....	<b>5</b>
3.1 COST PER WORKER ASSOCIATED WITH QUALIFICATION REQUIREMENTS FOR LINEMEN AND OTHER ELECTRICAL WORKERS .....	5
3.2 COST PER WORKER ASSOCIATED WITH QUALIFICATION REQUIREMENTS FOR SIGNAL PERSONS AND RIGGERS .....	7
3.3 COST PER WORKER ASSOCIATED WITH OTHER REQUIREMENTS IN THE NEW RULE .....	9
3.3.1 Requirement of a written job hazard analysis under WAC 296-45-67508 .....	10
3.3.2 Requirement of a hard hat or helmet under WAC 296-45-67508 .....	10
3.3.3 Requirement of a secondary attachment under WAC 296-45-67508.....	11
<b>4. ACTIONS TAKEN TO REDUCE THE IMPACT OF THE PROPOSED RULES ON SMALL BUSINESS</b> .....	<b>11</b>
<b>5. SMALL BUSINESS INVOLVEMENT IN THE RULEMAKING PROCESS</b> .....	<b>12</b>
<b>6. INDUSTRIES LIKELY TO BE REQUIRED TO COMPLY WITH THE RULE</b> .....	<b>12</b>
<b>7. NUMBER OF JOBS CREATED OR LOST</b> .....	<b>14</b>
<b>8. CONCLUSIONS</b> .....	<b>14</b>
<b>9: REFERENCES</b> .....	<b>15</b>
<b>10: APPENDIX</b> .....	<b>16</b>
TABLE A1: POWER LINE INFRASTRUCTURE OWNED BY LARGEST UTILITIES IN WA.....	16
TABLE A2: INDUSTRY-SPECIFIC OCCUPATIONS AFFECTED BY THE PROPOSED RULE .....	17
ONLINE SURVEY QUESTIONNAIRE .....	18

The Division of Occupational Safety and Health (DOSH) of the Washington State Department of Labor & Industries (L&I) is proposing changes to the rule under Section 296-45-675 WAC, regarding the regulation of helicopter-assisted power line work in the state of Washington.

The following Small Business Economic Impact Statement (SBEIS) was prepared in compliance with the Regulatory Fairness Act (RFA), RCW 19.85.040. It provides an analysis comparing the average costs associated with the implementation of the proposed rule changes to WAC 296-45-675 through WAC 296-45-67545 on small and large businesses.

## **1. INTRODUCTION OF THE PROPOSED RULE**

### **1.1 The background of this rulemaking**

In recent years, helicopters have helped linemen and other related electrical workers do their jobs in the power line work areas more efficiently and less costly to the customers than traditional approaches. As a result, helicopters have become one of the most important resources to assist in constructing transmission and distribution lines, performing line inspections, and responding to storm or other emergencies or damages. On the other hand, there may arise some safety issues as a consequence of these new industry practices, and workers could get injured or killed if sufficient safety measures are not implemented and followed.

In Washington, the safety standards for electrical workers under Chapter 296-45 WAC with regard to helicopter-assisted power line work have not been updated for many years. Therefore, parts of them are outdated and do not reflect best industry practices, or are inconsistent with federal or state laws, or are inadequate to protect electrical workers. In light of this situation, stakeholders have requested that L&I work with them to update these standards. In March 2013, the department issued a pre-proposal notice and officially initiated the rulemaking process.

Between January 24, 2013 and June 10, 2014, eight stakeholder meetings were held by the department to help develop the rule language. The stakeholder group is comprised of a mix of representatives from businesses identified as being most affected by the proposed rule. The group's membership includes representatives from utility companies, electrical contractors, and

helicopter providers. The draft rule was revised many times as a result of the discussions from each meeting and the draft was finalized in August 2014 after incorporating the comments from the last stakeholder meeting.

## **1.2 The description of the rule amendments**

The Federal Aviation Administration (FAA) regulates helicopter safety practices. However, the FAA's focus is on pilot safety and safe operation of aircraft. The Occupational Safety and Health Administration (OSHA) also plays a critical role in helicopter safety regulation with its focus on electrical workers who work on high voltage wires with the assistance of helicopters. As the administrator of an OSHA-approved state plan, L&I is required to coordinate with OSHA to ensure its rules are at least as effective as OSHA's. This proposal is primarily intended to protect electrical workers when they perform the work specified in the rule.

The proposed rule changes cover the sections from WAC 296-45-67503 through WAC 296-45-67545. Specifically, the following sections have been revised or added as a result of this rulemaking project:

- WAC 296-45-67503 was amended to include new definitions for the terms used in the proposed rule.
- WAC 296-45-67504 was created to state the certification requirement for helicopter service providers the rule would apply to.
- WAC 296-45-67506 was amended to expand the scope of this section to “all workers”, and to specify that they must be “qualified and trained” to perform their assigned work tasks.
- WAC 296-45-67508 was amended to address the requirement of hazard analysis and job briefing. A more-detailed written job hazard analysis (JHA) is now required before the commencement of any helicopter operation and an additional job briefing is required if working conditions change during the course of a job.
- WAC 296-45-67513 was amended to require that “ANSI approved” hard hats or helmets be provided for electrical work specified in this rule. This section also states that

employers must perform and document a hazard assessment to identify and determine the appropriate personal protective equipment (PPE).

- WAC 296-45-67519 was amended to add more details about landing zones.
- WAC 296-45-67521 was amended to address the pilot fatigue issue and to emphasize pilots' responsibility for safe operations of helicopter loads.
- WAC 296-45-67523 was revised to incorporate changes in hooking and unhooking loads to ensure that this section is consistent with the new practices of Human External Cargo (HEC) allowed under the new rule.
- WAC 296-45-67527 was revised to include more specifications related to the line stringing requirements.
- WAC 296-45-67531 was revised to incorporate changes to the communications between air crew and ground personnel, including the required utilization of "designated and qualified" signal persons and the limitations on the use of head signals.
- WAC 296-45-67533 was amended to reflect safe practices in helicopter operations including secured loads and the 20-minute reserve fuel requirements.
- WAC 296-45-67536 was added to allow new helicopter work tasks including the HEC and external cargo sling loads.
- WAC 296-45-67537 was amended to reflect changes in the sling and rigging requirements that are necessary to perform new practices allowed by the proposed rule.
- WAC 296-45-67545 was revised to improve clarity with regard to refueling operations and related requirements set forth under this section.

## **2. INTRODUCTION OF THE COST SURVEY**

To estimate the economic impact of the helicopter-assisted electrical work safety rule on affected businesses, L&I developed a business survey in the fall of 2014. This survey was created by the economists from L&I's Research and Data Services Program, in collaboration with the DOSH rulemaking technical team, L&I internal survey review committee and other relevant parties. The main purpose of this online survey was to gauge the probable new compliance costs that

businesses would incur if the identified rule changes were adopted, and to determine whether there exists a disproportionate cost impact on small businesses.

## **2.1 Survey development and sample size**

The survey was first designed by the economists in October 2014. The draft was then revised and reviewed by the rulemaking technical team from DOSH, followed by a number of meetings to discuss the details of these comments and suggestions. Per L&I internal policy, the survey was also submitted to its internal survey committee for their review. After another round of updates, it was finalized at the end of November. The final survey questionnaire was then posted on the SurveyGizmo, a popular online survey tool, by the agency's webmasters.

Due to the relatively small number (see Section 6 for more details) of affected businesses, the agency attempted to send the survey to as many businesses as possible. The final list selected for the survey included all the businesses that attended at least one stakeholder meeting, another 20 utility or electrical companies and 6 helicopter service providers that did not attend stakeholder meetings but would most likely be affected by the rule. The agency believes that these 47 businesses are representative of the population in the three major industries. On December 11, 2014, the agency officially sent out this online survey.

## **2.2 Survey contents and responses**

After a comparison between the proposed rule and the existing rule language and discussions with the technical team, L&I identified a few rule changes that are above current standards and would likely impose new costs on the businesses involved. Considering the length and the time needed to complete the survey, only the most important and costly components were included in the survey questionnaire.

The survey was organized as follows: the first section was designed to obtain the background information of each employer including the respondent's title, the number of employees, and the primary business areas; the second and the third sections ask the participants to estimate the probable new compliance costs related to two major proposed requirements: more training required for lineman and other electrical workers, and training for riggers, signal persons and

other ground personnel. The last section was intended to collect information regarding the major benefits of this rule.

On December 18, 2014 and January 8, 2015, the agency sent two reminders to all selected businesses. Between December 11, 2014 and January 19, 2015, the agency received 24 responses, among which 18 were complete and 6 were incomplete.

### **3. ASSESSING ECONOMIC IMPACT BY EMPLOYMENT SIZE**

The Regulatory Fairness Act, RCW 19.85.040(1) requires the department to determine whether a proposed rule will have a disproportionate cost impact on small businesses. The act directs the department to compare “the cost of compliance for small businesses with the cost of compliance for the ten percent of businesses that are the largest businesses required to comply with the proposed rule.” A convenient and easy way to make this comparison is to compare the compliance cost per employee for these two groups. This Small Business Economic Impact Statement (SBEIS) compares the average cost per affected worker for each component that represents increased requirements. The purpose here is to best estimate the extent to which the disproportionate impact, if any, is on small businesses rather than to estimate the total costs to the affected businesses as a whole. As this rule will affect only a small number of employers and the sample size for the survey is very small, we decided to compare the average unit cost between all small businesses and all larger ones.

#### **3.1 Cost per worker associated with qualification requirements for linemen and other electrical workers**

Section 2 in the survey asks respondents whether they have linemen or similar workers performing power distribution and transmission line work. If yes, they are required to provide the total number of workers, and the number of workers who need additional training in order to be eligible for the assigned work activities under the new rule. Then, they need to estimate the hours of training needed. To mitigate the impact of a small sample on our results, we used the mode, i.e., the most frequently occurring value, as the estimated training hours for each group.

Eighteen respondents indicated that they were subject to this requirement (“YES” to question 2a) and provided the number of workers needing additional training to be eligible. Of these 18 respondents, only 3 businesses are small businesses (and one indicated that they only hire signal persons) with an average size of 38 employees, and the remainder are large businesses with more than 50 employees.

In terms of additional training hours needed for linemen, one small business indicated their workers need 5-8 hours and another indicated more than 8 hours. For the large businesses, 7 indicated that their workers need 5-8 hours, accounting for 47% of that group. As to the additional training hours for other electrical workers, only 1 small business indicated that they hire these workers and they estimated that more than 16 hours of additional training would be required for them. In contrast, a half of the large businesses that hire these workers estimated that about 5-8 hours would be needed.

Using the median hourly wage of \$41.30 paid to a lineman in Washington<sup>1</sup>, the average training cost is between \$207 and \$330 for a lineman hired by large businesses. The average cost for small businesses is more likely to exceed \$330 per affected lineman. From the same data source, the weighted median hourly wage paid to other electrical workers is \$26.65<sup>2</sup>. Therefore, the average training cost is between \$133 and \$213 per worker for large businesses and over \$426 for small businesses. As discussed in the Cost-Benefit Analysis report for this rule, we assume that these workers need to be re-trained every 2 years. Therefore, the annualized training cost is only 50% of this total training cost for each affected workers.

There may be some other costs related to training such as travel to the field and the cost of purchasing training equipment and materials that were not captured in the survey. Given that large businesses will normally have some cost advantage on these items small businesses may be disproportionately affected by this training requirement.

---

<sup>1</sup> This was the hourly rate paid to Washington electrical power line installers and repairers in the 2014 Occupational Employment and Wage Estimates. The report was released by Washington Employment Security Department.

<sup>2</sup> The scope of other electrical workers discussed here is defined in subsection 2.3.1 of the Cost-Benefit Analysis report for this rulemaking (page 10).

In conclusion, we estimate that the cost of additional training for a lineman in small businesses is 22% or more than in large businesses, although the exact effect size is unknown. For other electrical workers, this unit cost is 145% or more for small businesses. However, the cost estimate for small businesses is based on only one response, so confidence in this estimate is low.

**Table 1: Unit cost relating to linemen and other electrical workers**

Cost Item /Business Size	Small business	large business
Training hours for linemen	One reported at 5-8 hours and another reported at > 8 hours	5-8 hours (47% employers)
Training cost for linemen	>= \$330 per affected worker	\$207 - \$330 per affected worker Average: \$269
Annualized cost for linemen	>= \$165 per affected worker	\$104 - \$165 per affected worker Average: \$135
Training hours for other electrical workers	> 16 hours	5-8 hours (50% employers)
Training cost for other electrical workers	> \$426 per affected worker	\$133 -\$213 per affected worker Average: \$173
Annualized cost for other electrical workers	> \$213 per affected worker	\$67 -\$107 per affected worker Average: \$87

### **3.2 Cost per worker associated with qualification requirements for signal persons and riggers**

There are other workers such as signal persons and riggers who are also an integral part of the work crew. If they don't receive appropriate safety training, serious or sometimes even fatal accidents can occur to them and the other workers around them.

Section 3 in the survey asks respondents whether they have hired these ground personnel to support power line work and if yes, how many they have hired and how many of them would

need additional training in order to be eligible for the assigned work activities under the new rule. They are then asked to estimate the hours of training needed for those identified. To mitigate the impact of a small sample on these results, we use the mode, i.e., the most frequently occurring value, as the estimated training hours for each group.

Twelve respondents indicated that they were subject to this requirement (“YES” to question 3a) and provided the number of workers hired and needing additional training to be eligible. Of these 12 respondents, only 2 businesses are small businesses (one of them did not report training hours), and the remaining are large businesses with more than 50 employees.

In terms of additional training hours needed for signal persons, the small business indicated their workers need 5-8 hours. For large businesses, about 38% of them reported at 3-4 hours and another 38% reported at 5-8 hours. As to the additional training hours for riggers, the small business indicated that their workers need more than 8 hours of additional training. In contrast, 50% of the large businesses that hire riggers estimated about 5-8 hours would be needed.

Using the average hourly wage of \$26.02<sup>3</sup>, the average training cost is between \$78 and \$208 for a signal person hired by large businesses. The average cost for small businesses is between \$130 and \$208 per affected signal person. The average training cost for a rigger is between \$130 and \$208 for large businesses and more than \$208 for small businesses. We also assume that these workers need to be re-trained every 2 years and the annual cost is 50% of this total training cost for each affected workers.

For other costs relating to training such as travel to the field and the cost of purchasing training equipment and materials that were not captured in the survey, we believe large businesses will have some cost advantage over their smaller counterparts.

In conclusion, we estimate that the cost of additional training for a signal person in small businesses is 18% or more than in large businesses. For other electrical workers, this unit cost is 22% or more for small businesses, although the exact effect size is unknown.

---

<sup>3</sup> Same data source as in footnote 2.

**Table 2: Unit cost relating to signal persons and riggers**

Cost Item /Business Size	Small business	large business
Training hours for signal persons	5-8 hours	38% of them reported at 3-4 hours and another 38% reported at 5-8 hours
Training cost for signal persons	\$130 - \$208 Average: \$169	\$78 - \$208 Average: \$143
Annualized cost for signal persons	\$65 - \$104 per affected worker Average: \$85	\$39 - \$104 per affected worker Average: \$72
Training hours for riggers	> 8 hours	5-8 hours (50% employers)
Training cost for riggers	> \$208 per affected worker	\$130 - \$208 per affected worker Average: \$169
Annualized cost for riggers	> \$104 per affected worker	\$65 -\$104 per affected worker Average: \$85

### **3.3 Cost per worker associated with other requirements in the new rule**

The new rule proposes other requirements needed to protect electrical workers performing certain types of tasks. These include a requirement of a written job hazard analysis before the commencement of any helicopter operation under WAC 296-45-67508, a requirement of ANSI approved hard hats or helmets for electrical work associated with helicopter operations under the revised section of WAC 296-45-67513, and a requirement of a primary and secondary attachment means for helicopter operations involving HEC under WAC 296-45-67536.

As indicated in Table 3, some components are reflective of the current federal or national consensus standards and will not be considered as new or increased requirements from this proposed rule.

**Table 3: Other rule components that may impose additional costs**

WAC Number	Rule Contents	Cost Items	Source of Estimates
WAC 296-45-67504 and WAC 296-45-67521	<i>Pilot training, qualifications and responsibilities</i>	<i>Not considered as a new requirement from the proposed rule</i>	<i>Inherited from FAA, OSHA or other federal standards.</i>
WAC 296-45-67508	<i>A written job hazard analysis before the commencement of any helicopter operation.</i>	<i>Time needed by a supervisor or lead worker to prepare this report for each task.</i>	<i>Based on internal technical experts' estimates.</i>
WAC 296-45-67513	<i>An ANSI approved hard hat or helmet for electrical work associated with helicopter operations</i>	<i>Cost of providing an ANSI Class E hard hat for each worker involved.</i>	<i>Market prices from various hardware stores</i>
WAC 296-45-67533	<i>Increase of the reserve fuel requirement from 15 minutes to 20 minutes</i>	<i>Not considered as a new requirement from the proposed rule</i>	<i>Inherited from 14 CFR 91.151(b) regarding the federal minimum fuel standard.</i>
WAC 296-45-67536(1)(a)	<i>Sling / vertical suspension system for HEC</i>	<i>Not considered as a new requirement from the proposed rule</i>	<i>Inherited from FAA regulations under 14 CFR Part 133.</i>
WAC 296-45-67536(1)(b)	<i>A secondary attachment means to prevent inadvertent release of HEC load</i>	<i>Most employers use a belly band system, or an emergency anchor as the most cost effective means.</i>	<i>Market prices from various hardware stores</i>
WAC 296-45-67536(1)(c)	<i>External platform and skid system for the HEC</i>	<i>Not considered as a new requirement from the proposed rule</i>	<i>Inherited from FAA regulations under 14 CFR Part 133.</i>

**3.3.1 Requirement of a written job hazard analysis under WAC 296-45-67508**

This is a new requirement proposed by the rule and it is intended to improve the understanding of the nature of the work tasks and to increase the safety awareness for each worker involved before the work begins. The agency estimates that it will normally take 1.5 hours or less for a supervisor or lead worker to prepare this material. Using the median hourly wage of \$33.16, the total cost is near \$50 for each operation. As such, we believe there is no significant difference in this cost between small and large businesses.

**3.3.2 Requirement of a hard hat or helmet under WAC 296-45-67508**

The proposed rule requires that an ANSI approved hard hat or helmet be used for electrical work associated with helicopter operations. The agency estimates that a basic ANSI Class-E hard hat is priced between \$6.50 and \$18.50, with an average cost of \$10.00. As this cost is the same for

any worker regardless of whether they are from small or large businesses, we don't conclude that small businesses would bear a higher cost than their larger counterparts as a result of complying with this rule.

### **3.3.3 Requirement of a secondary attachment under WAC 296-45-67508**

An additional safety device has been widely used in the utility industry to protect workers involved in the Class-B HEC. This secondary device can catch the person suspended by a line outside the helicopter if the aircraft's primary attachment means fails or is inadvertently released by the pilot. Most employers have used a belly band system, or an emergency anchor, which is an affordable and effective option. While this is an extra cost to the businesses, it does save many lives. Based on the cost information available online and from various stores, the agency estimates the average cost of this type of device at \$200, with a range from \$100 to \$300. If it needs to be replaced every 5 years as recommended<sup>4</sup>, the annual cost would be \$20 to \$60 per affected worker. For the same reason specified in subsection 3.3.2, this is a flat cost so we don't estimate that small businesses would bear a higher cost than their larger counterparts as a result of this requirement.

## **4. ACTIONS TAKEN TO REDUCE THE IMPACT OF THE PROPOSED RULES ON SMALL BUSINESS**

The above analysis indicates that except for the cost of training other electrical workers, small businesses are likely to bear a slightly disproportionate share of regulatory burden, ranging from 18% to 22%, with the implementation of the proposed rule. In addition, the majority of businesses affected by this rule are large businesses. For these reasons, the agency did not develop any specific actions to mitigate this impact. That being said, many existing free services, although not specifically designed for this rule, are available and will be very helpful to affected small businesses. These services include training and education opportunities, free materials to help them develop their safety plans, and consultation services for all small businesses.

---

<sup>4</sup> This is the recommendation from the U.S. Department of Interior in its Helicopter Short-Haul Handbook published in February, 2010.

## **5. SMALL BUSINESS INVOLVEMENT IN THE RULEMAKING PROCESS**

The department has made a considerable effort to involve small businesses and their representatives at various points in this rulemaking process. These efforts include:

- (1) Since January 24, 2013, the department has held 8 stakeholder meetings in Tumwater and other regional offices to hear from the business community, including representatives from a number of small businesses. There was also a stakeholder comment period after each series of meetings. The representatives of small businesses, along with all the other attendees, have made a significant contribution to the development of the new rule. The department developed the draft rule in August 2014 with consideration of all the comments and concerns submitted by interested stakeholders from across the state, including the small business community.
- (2) The department conducted a business survey in December, 2014 to estimate the economic impact of this rule. A certain number of small businesses were selected to participate in this survey and provide their inputs.
- (3) The department will conduct a public hearing for this proposed rule after the CR-102 is filed. During this hearing, small businesses will have opportunities to provide their comments and suggestions on this proposed rule.

## **6. INDUSTRIES LIKELY TO BE REQUIRED TO COMPLY WITH THE RULE**

The proposed rule will apply to the businesses involved in the power distribution and transmission line construction, alteration, repair or similar work with the assistance of a helicopter or other similar device. Three major types of businesses have been identified as the affected businesses: utility providers, electrical contractors, and helicopter service providers specialized in utility projects. Within each of these types of businesses, only those firms that have participated or will participate in helicopter-assisted utility work will be affected by the proposed rule changes. Therefore, this rule will affect a relatively small number of specialized businesses in these three industries.

Due to the fact that the proposed rule will introduce new work activities such as the HEC operations that are currently not allowed in Washington, we needed to identify the businesses that have already performed these activities in other states, as well as those that are currently not involved, but have a plan to do so should this new rule be adopted. A few steps were taken to identify the pool of the affected businesses. First, all 21 businesses that participated in stakeholder meetings were part of the population as they have shown their strong interest and support for this proposed rule. Second, based on the agency’s internal administrative database on registered businesses, another 40 utility or electrical companies that currently specialize in the power line work and will likely use helicopter services were identified. Third, multiple data sources were scrutinized to identify helicopter companies that provide services for power line projects and seem likely to engage in this business in Washington. These include the Helicopter Association International (HAI) online membership directory and the Helicopter Links online directory. Based on the locations of these helicopter companies, the types of helicopters each company owns and operates, and the work areas they specialize in<sup>5</sup>, we determined that approximately 24 helicopter providers would be affected by the proposed rule. Altogether, at least 85 businesses in the three major industries are expected to be affected by the proposed rule, with the actual population thought to be slightly larger.

**Table 4: The population of affected businesses**

Type of business	Total number of affected businesses
Electric utility providers <sup>6</sup>	37
Electrical contractors	24
Helicopter service providers	24
All	85

---

<sup>5</sup> We estimate that the helicopter providers that will most likely be affected by this rule are those that are located in Washington or the adjacent states, own and operate at least one helicopter designed for external cargo operations in electric utility industry (such as MD 500 and its variants, Bell JetRanger series, etc.), particularly in power line construction, alteration, repair or maintenance work. The providers that only conduct power line patrol will be excluded.

<sup>6</sup> See Table A1 in the Appendix for the largest utility companies operating in the state and the power lines they own.

## **7. NUMBER OF JOBS CREATED OR LOST**

The introduction of the HEC operations is expected to significantly improve the work productivity of power line projects. As a result, fewer labor hours, or fewer workers may be needed for the same size of project under this new practice. For this reason, the department does anticipate that a certain number of jobs may be lost due to these rule changes. However, we do not know the extent to which this proposed rule would impact total employment in these three affected industries<sup>7</sup>.

## **8. CONCLUSIONS**

As we have analyzed above, this proposed rule is likely to impose slightly disproportionate compliance costs on small businesses as a whole. The extent of the disproportion varies among different rule components, ranging from no disproportionate impact to as much as 145% higher cost for small businesses.

---

<sup>7</sup> The industry-specific occupations that would be affected by the proposed rule are presented in Table A2 in the Appendix.

## 9: REFERENCES

- Aviation Management Directorate (2010). *Helicopter Short-Haul Handbook*. U.S. Department of the Interior.
- Beach, J. and Dilts, N. (2007). *Electric Transmission & Distribution Infrastructure: Powerful Spending Trend Forecast to Extend well into the Next Decade*. Industry Analysis.
- Carbajal, D. and Billingsley, J. (2012). *SCE Refines Human External Cargo Program*. T&D World Magazine.
- Chelan County PUD (2004). *Customer Utilities FAQ Sheet*. Wenatchee, WA.
- Chupka, et al. (2008). *Transforming America's Power Industry: the Investment Challenge 2010–2030*. Edison Foundation, Washington, D.C.
- Federal Aviation Administration (2012). *Classifying and Using a Belly Band System as a Portable Safety Device (PSD) in Part 133 Operations, Information for Operators (INFO) 12015*, U.S. Department of Transportation.
- Fischbach, A. (2010). *Adrenaline Rush*. T&D World Magazine.
- Hall, K. (2013). *Out of Sight, out of Mind 2012*. Edison Electric Institute, Washington D.C.
- Hirst, E. (2004). *U.S. Transmission Capacity: Present Status and Future Prospects*. Office of Electric Transmission and Distribution, U.S. Department of Energy.
- Neville, J. (2014). *Flying High: New Program Expands Aerial Maintenance*. Western Area Power Administration News.
- North American Electric Reliability Corporation (2014). *Annual Report on the Long-Term Reliability Assessment, 2009-2013*. NERC, Princeton, NJ.
- Owen, D. (2008). *The Need for New Transmission: How Will We Pay for it?* Edison Electric Institute, Washington D.C.
- Parks, J (2008). *Adventurous Linemen Enjoy Helicopter Work*. T&D World Magazine.
- Quanta Technology (2009). *Cost-Benefit Analysis of the Deployment of Utility Infrastructure Upgrades and Storm Hardening Programs*. Final report for Project No. 36375 to Public Utility Commission of Texas, Raleigh, NC.
- Shehab, R., Schlegel, R., and Palmerton, D. (1998). *A Human Factors Perspective on Human External Loads*. U.S. Department of Transportation.

## 10: APPENDIX

**Table A1: Power line infrastructure owned by largest utilities in WA**

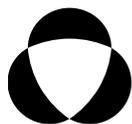
Company	Power Line Systems and Population Served
<i>All Washington PUDs excluding Snohomish</i>	<i>Combined have installed <b>33,059</b> miles of electric power lines, serving 634,121 customers based on its 2011 operating year data.</i>
<i>Puget Sound Energy</i>	<i>Its power distribution system includes <b>2,597</b> miles of transmission lines (<math>\geq 55</math>kV) and <b>20,428</b> miles of distribution lines (<math>&lt; 55</math>kV), serving more than 1 million customers. About a half of distribution lines are overhead lines.</i>
<i>Avista Utilities</i>	<i>Owns <b>2,719</b> miles of transmission lines and <b>19,000</b> miles of distribution lines in Washington, Idaho and Oregon, serving a total of 1,610,000 customers. Utility operating revenues from Washington accounted for <b>62.94%</b> in 2013.</i>
<i>Snohomish County PUD</i>	<i>The PUD has a total of <b>6,321</b> miles of power lines in 2013, serving 750,000 customers.</i>
<i>Pacific Power</i>	<i>Owns <b>16,300 miles of transmission lines and 62,930 miles of distribution lines</b> in Oregon, Wyoming, Washington, Utah, Idaho and California. There are 127,967 Washington customers, accounting for <b>7.24%</b> of its total customers.</i>
<i>Seattle City Light</i>	<i>Owns <b>656</b> miles of transmission and <b>2,300</b> miles of distribution lines, serving almost 700,000 people, according to its 2013-2018 Strategic Plan Report.</i>

**Table A2: Industry-specific occupations affected by the proposed rule**

Affected Occupations	Affected Industries	Employment Share by Industry	Combined Share	Affected Workers as % of Total*
Electrical Power Line Installers & Repairers	Electric Power Generation, Transmission and Distribution	50.1%	62.1%	51.9%
	Power system construction	12.0%		
Installation, Maintenance & Repair Helpers	Electric Power Generation, Transmission and Distribution	1.5%	2.8%	1.8%
	Power system construction	0.6%		
	Nonscheduled Air Transportation	0.1%		
	Support Activities for Air Transportation	0.6%		
Construction Laborers	Electric Power Generation, Transmission and Distribution	0.1%	2.5%	1.5%
	Power system construction	2.4%		
Riggers	Electric Power Generation, Transmission and Distribution	0.3%	1.3%	1.1%
	Power system construction	1.0%		
Installation, Maintenance, and Repair Workers, All Other	Electric Power Generation, Transmission and Distribution	0.4%	1.6%	1.4%
	Power system construction	0.3%		
	Support Activities for Air Transportation	0.9%		
First-Line Supervisors of Mechanics, Installers, and Repairers	Electric Power Generation, Transmission and Distribution	3.1%	4.4%	4.4%
	Power system construction	0.3%		
	Nonscheduled Air Transportation	0.2%		
	Support Activities for Air Transportation	0.8%		

\*: These percentages are derived based on the combined share of employment across the affected industries and the share of workers needing additional training collected from the survey.

## Online Survey Questionnaire



Washington State Department of  
**Labor & Industries**  
*Division of Occupational Safety and Health*

## 2014 Rulemaking Survey on Safety Standards for Electrical Workers

### INTRODUCTION:

The purpose of this survey is to determine both new costs and benefits your business may have due to the new or increased requirements in the proposed safety standards for power distribution and transmission line work with assistance of helicopter or rotorcraft. Your answers are very important for us to accurately estimate the economic impact of the proposed rule on affected businesses.

There are four sections in this survey:

- **Section 1:** General questions about your business as a whole.
- **Section 2:** Questions to answer if your business employs **linemen and other supporting electrical workers** who perform power distribution and transmission line installation, construction and repair work.
- **Section 3:** Questions to answer if your business employs **riggers, signal persons and other ground personnel** to assist with these electrical tasks.
- **Section 4:** Questions about your opinions on the benefits of the proposed rule. Please **complete this section** if it applies to you as your input is critical to an accurate estimate on the benefits of the proposed rule.

Please answer the questions the best you can. If you do not have the exact information, use your best estimate.

**Section 1: General Questions About Your Business**

1a. Please describe your title / position in your company.

- A: Business Owner / Co-Owner
- B: President / CEO / Chairman
- C: General Manager
- D: Safety Manager / Director
- E: Engineer /Lead Worker
- F: Other. Please specify: \_\_\_\_\_

1b. During 2014, what was the maximum number of full-time workers your business employed?

\_\_\_\_\_ full-time workers (*if none, enter 0*)

1c. During 2014, how many total hours did your part-time and/or seasonal employees work?

\_\_\_\_\_ hours (*if none, or if you don't employ part-time or seasonal workers, enter 0*)

1d. Please check **all** the industry descriptions that apply to your business:

- Utility provider involving electrical power generation, transmission and distribution
- Electrical contractor
- Helicopter services provider
- Others: Please specify \_\_\_\_\_

## Section 2: Linemen and Other Supporting Electrical Workers

Please read the text in the box below before answering the following questions.

The standards under proposed WAC 296-45-675 shall apply to work being done on or near any rotorcraft, helicopter crane, or similar device when such device is for **power distribution and transmission line construction, alteration, repair** or similar work.

WAC 296-45-67536 (1) specifies **Human External Cargo (HEC)** practice in electrical work which is not currently allowed. Workers would be lifted by **helicopters** through a **slings/ vertical suspension system** to perform such electrical work.

WAC 296-45-67506(1) requires all personnel be **physically and mentally able and qualified** to perform the work to which they are assigned, including being knowledgeable in these rules.

2a. Do your employees perform **any of** the following tasks: power distribution and transmission line construction, alteration, repair, line inspection, or field survey?

- Yes: How many **linemen**? \_\_\_\_ . How many **supporting electrical workers**? \_\_\_\_ .
- No: Please go to Section 3: Riggers, Signal Persons, and Other Ground Personnel.

2b. How many of your **linemen** need **additional training** to be able and qualified to perform their jobs while carried or suspended as HEC by a helicopter, as outlined in the box above?

\_\_\_\_\_ linemen (*If none, enter 0*).

2c. For each lineman identified in 2b, please estimate **the hours of additional training** needed to meet the proposed requirement.

- A: less than 1 hour       B: 1 ~ 2 hours
- C: 3 ~ 4 hours       D: 5 ~ 8 hours
- E: more than 8 hours, please specify: \_\_\_\_\_ hours

2d. How many of your **supporting electrical workers** need **additional training** to be able and qualified to perform their jobs while carried or suspended as HEC by a helicopter?

\_\_\_\_\_ supporting electrical workers (*If none, enter 0*).

2e. For each supporting workers identified in 2d, please estimate **the hours of additional training** needed to meet the proposed requirement.

- A: less than 2 hours       B: 2 ~ 4 hours
- C: 5 ~ 8 hours       D: 9 ~ 16 hours
- E: more than 16 hours, please specify: \_\_\_\_\_ hours

2f. Please estimate other costs, if any, that are needed to meet the proposed requirement **in this section** (for example, the cost related to the interpretation of the new rules, or job briefing).

\$\_\_\_\_\_ **per** lineman or supporting electrical worker

### Section 3: Signal Persons, Riggers, and Other Ground Personnel

Please read the text in the box below before answering the following questions.

WAC 296-45-67506 (2) requires that there must be a sufficient number of **qualified** ground personnel to safely **guide, secure, hook and unhook** the load. All personnel must be **physically and mentally able and qualified** to perform the work to which they are assigned, including being knowledgeable in these rules.

WAC 296-45-67537 (2) proposes that all personnel involved with **rigging activities** must receive appropriate rigging training and show proficiency, **specific to helicopter operations** and the work or tasks being performed.

WAC 296-45-67506 (3) states no employee shall perform or be ordered or assigned to perform any activity for which they are not **trained, qualified and competent** or which they may compromise their safety or the safety of others, including all the ground personnel.

3a. Are any of your workers designated as **signal persons or riggers**?

Yes: How many **signal persons**? \_\_\_\_\_. How many **riggers**? \_\_\_\_\_.

No: Please go to 3f.

3b. How many of your workers designated as **signal persons** need **additional training** to be able and qualified to perform their jobs, while around **Human External Cargo** by a helicopter?

\_\_\_\_\_ signal persons (*If none, enter 0*).

3c. For each **signal person** identified in 3b, please estimate **the hours of additional training** needed to meet the proposed requirements.

A: less than 1 hour       B: 1 ~ 2 hours

C: 3 ~ 4 hours       D: 5 ~ 8 hours

E: more than 8 hours, please specify: \_\_\_\_\_ hours

3d. How many of your workers designated as **riggers** need **additional training** to be able and qualified to perform their jobs, while around **Human External Cargo** by a helicopter?

\_\_\_\_\_ riggers (*If none, enter 0*).

3e. For each **rigger** identified in 3d, please estimate **the hours of additional training** needed to meet the proposed requirements.

A: less than 1 hours       B: 1 ~ 2 hours

C: 3 ~ 4 hours       D: 5 ~ 8 hours

E: more than 8 hours, please specify: \_\_\_\_\_ hours

3f. Please estimate new costs that are related to the proposed requirement for **other involved ground workers (other than signal persons or riggers)**.

How many ground workers? \_\_\_\_\_. How much cost? \$\_\_\_\_\_per ground worker.

## Section 4: Benefit Estimate

Please read the text in the box below before answering the following questions.

Under the proposed rule, there are three possible benefits to businesses, employees and society if helicopter operations **involving Human External Cargo (HEC)** are allowed to facilitate the power distribution and transmission line construction, alteration, repair or similar work.

**Benefit 1: Total time** needed to complete these tasks could be significantly **reduced**.

**Benefit 2: Reduced exposure to injury hazards** for linemen, pilots and ground personnel involved due to the reduced completion time and a higher level of safety training.

**Benefit 3: Faster power restoration for electricity customers** if a power outage occurs.

4a. Have you already performed the work specified in this rule with the assistance of helicopter operations involving **Human External Cargo (HEC)** in other states?

- Yes: Please answer the following questions.
- No: You have completed the survey. Thank you!

4b. For a typical **power line construction** project, please estimate:

- 1) On average, how many construction projects does your company complete in a normal year? \_\_\_\_\_ projects.
- 2) On average, **without** the assistance of HEC, how long will it take to complete such projects? \_\_\_\_\_ **hours** for a typical project.
- 3) On average, **with** the assistance of HEC, how long will it take to complete such projects? \_\_\_\_\_ **hours** for a typical project.

4c. For a typical **power line alteration** project, please estimate:

- 1) On average, how many alteration projects does your company complete in a normal year? \_\_\_\_\_ projects.
- 2) On average, **without** the assistance of HEC, how long will it take to complete such projects? \_\_\_\_\_ **hours** for a typical project.
- 3) On average, **with** the assistance of HEC, how long will it take to complete such projects? \_\_\_\_\_ **hours** for a typical project.

4d. For a typical **power line repair or inspection** project, please estimate:

- 1) On average, how many repair or inspection projects does your company complete in a normal year? \_\_\_\_\_ projects.
- 2) On average, **without** the assistance of HEC, how long will it take to complete such projects? \_\_\_\_\_ **hours** for a typical project.
- 3) On average, **with** the assistance of HEC, how long will it take to complete such projects? \_\_\_\_\_ **hours** for a typical project.