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## **INITIAL STATEMENT OF REASONS**

### CALIFORNIA CODE OF REGULATIONS

TITLE 8: Sections 3441 and 3449 of the General Industry Safety Orders

### **Outdoor Agricultural Operations During Hours of Darkness**

#### **SUMMARY**

On December 2, 2013 the Division of Occupational Safety and Health submitted a request to amend Section 3441, Operation of Agricultural Equipment. The requested amendments pertained to illumination near agricultural equipment and personal protective equipment to increase the visibility of workers. On February 13, 2014, a letter was submitted by Anne Katten, MPH, and Mark Schacht of the California Rural Legal Assistance Foundation regarding agricultural field operations to supplement requirements for work area lighting near agricultural equipment operations. As a result, the Occupational Safety and Health Standards Board (Board) convened advisory committee meetings to discuss hazards associated with outdoor agricultural work during hours of darkness.

#### **SPECIFIC PURPOSE AND FACTUAL BASIS OF PROPOSED ACTION**

This rulemaking is intended to address hazards related to performing outdoor agricultural work during hours of darkness (sunset to sunrise), when illumination or visibility is limited. The decreased natural lighting during hours of darkness affects the employees' ability to perceive and move about their environment. In addition, employees are less visible to others. Adequate lighting will enable employees to avoid visible and recognizable hazards. The increased visibility of employees will help operators of mobile agriculture equipment keep a safe distance away from employees.

The proposal amends Section 3441(g) and creates a new Section 3449 utilizing a repealed section.

#### **Section 3441.**

Section 3441 contains requirements regarding the operation of agricultural equipment. The proposed amendments to subsection (g) are the following:

- Adds trucks as one of the vehicles required to utilize and maintain functioning headlight(s). Trucks are commonly driven on farm roads.

- Requires that the headlights of agricultural equipment be utilized from sunset to sunrise instead of one hour after sunset and one hour before sunrise. This is necessary in order to be consistent with the proposed new Section 3449(a) regarding illumination requirements for outdoor work areas.
- Adds a Note to refer the reader to proposed new Section 3449 for illumination requirements for working near agricultural equipment during hours of darkness.

### **Section 3449.**

- The proposal adds a new Section 3449 with the title “Agricultural Operations During Hours of Darkness (Between Sunset and Sunrise)” replacing “Ladders (Repealed)”. The following provisions are proposed to be added:
- Subsection (a) requires that the employer provide lighting to illuminate the outdoor work environment. The employer is responsible for determining the combination of lighting: type of lamps, the number of light fixtures, type of fixtures (portable, portable personal hand-free and/or fixed lighting) and the setup needed in order to meet the illumination levels detailed in Table 1. The illumination level is to be measured at the task/working surface, in the plane in which the task/work surface is present. The table provides measurable criteria to determine adequate illumination.

The information used to populate the table was based on the principles of lighting detailed in the documents relied on and light surveys conducted by Board staff and advisory committee members, which are reflected in the minutes of the advisory committee meetings.

- Subsection (a)(1) was added to clarify that portable personal hands-free lighting shall be provided and used when other sources of lighting cannot meet the required illumination level listed on Table 1.
- Note 1 to subsection (a) was added to inform employers to be mindful of the manner they set up or install lighting to avoid glare. Glare can be blinding and may lead to accidents. The reason text is proposed as a Note and not regulatory language is due to the difficulty of measuring glare in a dynamic environment, making such a requirement unenforceable.

Note 2 to subsection (a) directs the reader to the non-mandatory appendix for additional information regarding selecting light sources.

- An exception to subsection (a) for vehicles traveling on farm roads was added. This is to inform employers that the supplementary lighting installed on mechanical equipment or vehicles to meet the illumination levels of Table 1 does not need to be activated when traveling on farm roads. The additional lighting may direct unwanted light to other vehicles on the road and may cause an accident.

- Subsection (b) requires supervisors to conduct a safety meeting at the beginning of the shift to inform employees of the location of the restrooms, drinking water, designated break area, nearby bodies of water, and high traffic areas. This proposal is to inform employees about the details of their work environment because outdoor agricultural work is not a fixed site and work conditions change.
- A Note to subsection (b) was added to inform the employer of their responsibility to communicate hazards under Section 3203, Injury and Illness Prevention Program.
- Subsection (c) requires employees to wear employer provided Class 2 high visibility garments meeting the requirements of Section 3380(e) in order for them to be more visible at night. The increased visibility of employees will prevent accidents involving motor vehicles and other moving agricultural equipment. Employees often work alongside agricultural fields alongside mobile agricultural equipment. The fields may be located near busy farm roads.
- Note to subsection (c) was added to inform the employer of other provisions related to subsection (c). Section 3380 is about personal protective devices and Section 3383 is about body protection.

These proposed amendments are necessary to ensure a safe work environment for employees during hours of darkness by addressing the hazards presented by limited ambient lighting.

#### **Non-Mandatory Appendix to Section 3449.**

The Appendix serves as a guide to employers in selecting light sources or lamps. The Appendix provides some factors to consider such as: wattage, quantity of light or brightness, beam angle, radium, and target, scotopic/photopic ratios, color rendering index, and life expectancy of the light source.

#### **DOCUMENTS INCORPORATED BY REFERENCE**

- American National Standard for High-Visibility Safety Apparel and Accessories, (ANSI/ISEA) 107-2015.

#### **TECHNICAL, THEORETICAL AND/OR EMPIRICAL STUDIES, REPORTS OR DOCUMENTS RELIED ON BY THE BOARD**

1. Division of Occupational Safety and Health, Form 9 Request for New or Change in Existing Safety Order, dated December 2, 2013.
2. Letter submitted by Anne Katten, MPH, and Mark Schacht of the California Rural Legal Assistance Foundation, dated February 13, 2014.

3. May 6, 2014 and March 27, 2015, Advisory Committee minutes, members rosters, and attendance sheets.
4. American National Standard, Illuminating Engineering Society of North American, (ANSI/IES) RP-7-1991, "Practice for Industrial Lighting".
5. National Cooperative Highway Research Program, NCHRP Report 498, "Illumination Guidelines for Nighttime Highway Work". Transportation Research Board of the National Academies, 2003.
6. Fairbank, W., Ede, L., Johnson, H., Luvisi, D., & Neja, R. (January-February 1987). "Night Picking". California Agriculture, pages 13-16.
7. Reese, P. (2015, May 19). "California Farms Added Workers In 2014, even amid drought". Sacramento Bee.
8. SP Ratios and Mesopic Vision, Issue 1- 05/2013, Lighting Industry Association, Technical Statement, LIA TS 24.
9. California Agriculture Volume 72, Number 2, November 1, 2017, "Employment and earning of California Farmworkers in 2015", pages 107-113.
10. California Agricultural Statistics Review, 2015-2016, page 1.

These documents are available for review Monday through Friday from 8:00 a.m. to 4:30 p.m. at the Standards Board Office located at 2520 Venture Oaks Way, Suite 350, Sacramento, California.

### **PETITION**

This proposal was not the result of a petition.

### **ADVISORY COMMITTEE**

This proposal was developed with the assistance of an advisory committee. (A list of advisory committee members, attendance sheets, and minutes are included as Documents Relied Upon.)

### **FIRE PREVENTION STATEMENT**

This proposal does not include fire prevention or protection standards. Therefore, approval of the State Fire Marshal pursuant to Government Code Section 11359 or Health and Safety Code Section 18930(a)(9) is not required.

### **SPECIFIC TECHNOLOGY OR EQUIPMENT**

This proposal will not mandate the use of specific technologies or equipment.

### **ECONOMIC IMPACT ANALYSIS/ASSESSMENT**

It is estimated that the economic impact of this regulation will be approximately \$31.6 million. The regulation will affect all outdoor agricultural operations businesses that perform work during hours of darkness (sunset to sunrise). Crops harvested during hours of darkness by some farmers include but are not limited to: apples, bell peppers, broccoli, eggplant, garlic, melon, hay, lettuce, okra, olives, onions, peaches, strawberries, tomatoes, sweet corn, and wine grapes. Outdoor farm animal related activities if performed during hours of darkness will be affected by this rulemaking. Examples of these activities are egg gathering, herding, inspection and pushing cows. The types of jobs that will be impacted include farm workers, farm equipment operators, and farm labor contractors.

Sections 3441 and 3449 will impact an estimated 16,031 establishments. This figure is obtained from the Employment Development Department for the particular NAICS or industry codes for covered sectors.<sup>1</sup> There is no data available on the number of businesses that work at night covered by the proposal. But if we assume 25% of the 16,031 establishments covered by the proposal will have employees working at night at some point during the year, we estimate 4,008 (16,031 x .25) establishments may be impacted by the proposal's requirements.

To comply with the safety requirements of the proposal, employers must use appropriate lighting and personal protective equipment (PPE) to aid visibility of workers at night. The costs associated with meeting these requirements are listed below.

#### **Costs associated with items required for proposal compliance.**

Item	Cost	Reference
Rechargeable battery headlamp	\$24.50	<a href="https://www.walmart.com/search/?query=rechargeable%20battery%20headlamp&amp;cat_id=0">https://www.walmart.com/search/?query=rechargeable%20battery%20headlamp&amp;cat_id=0</a>
AA rechargeable batteries	\$1.50	<a href="https://www.walmart.com/search/?query=rechargeable%20aa%20batteries&amp;cat_id=0">https://www.walmart.com/search/?query=rechargeable%20aa%20batteries&amp;cat_id=0</a>
High-visibility vest	\$10.00	<a href="https://www.walmart.com/ip/2XL-Surveyor-Orange-Two-Tones-Safety-Vest-ANSI-ISEA-107-2015/122387872">https://www.walmart.com/ip/2XL-Surveyor-Orange-Two-Tones-Safety-Vest-ANSI-ISEA-107-2015/122387872</a>

<sup>1</sup> Labor Market Information Database (LMID - Quarterly Census of Employment and Wages Data Search Tool: <http://www.labormarketinfo.edd.ca.gov/cgi/dataanalysis/areaselection.asp?tablename=industry> for 2015 data); with 16,031 establishments, corresponding to employment of 417,542.

Rechargeable portable generator	\$200.00	<a href="https://www.alibaba.com/showroom/rechargeable-generator-portable.html">https://www.alibaba.com/showroom/rechargeable-generator-portable.html</a>
Bulldog Power Tower portable lighting	\$1,300.00	<a href="http://catalog.lightingspecialties.com/viewitems/bulldog/bulldog-po">http://catalog.lightingspecialties.com/viewitems/bulldog/bulldog-po</a>
Power for generator	\$6,000.00	Assumption based on seasonal harvest, \$1000/month for 6 months of the year <sup>2</sup> [NOTE: Ongoing cost of compliance]

- a. Initial costs for a small business = \$7,651  
 Ongoing costs = \$6,000

California Government Code section 11346.3 defines small businesses as businesses that are independently owned and operated, not dominant in their field of operation, and have fewer than 100 employees. The California Employment Development Department (EDD) reports that 94.4% of the businesses in California’s Agriculture, Forestry, Fishing and Hunting Industry (NAICS 11) had fewer than 100 employees in the third quarter of 2016.<sup>3</sup> Calculations assume that a similar percentage of small businesses in the agricultural sectors covered by this proposal will be impacted, resulting in an estimated 3,784 small businesses and 224 typical businesses used for this analysis.

To compute the cost for each **small** business, apply the 37.7%<sup>4</sup> share of employment in small business to the relevant cost per employee portion (rechargeable battery headlamp, batteries and high visibility vest) of the formula, divided by the number of small businesses covered by the proposal (3,784). Then add the fixed cost per business for lighting/power (\$7,500).  
 $[\$36 * 42,110 * 37.7\%]/3,784 + [\$7,500] = \$7,651$

- b. Initial costs for a typical business (non-small business) = \$11,716  
 Ongoing costs = \$6,000

Similarly, to compute the cost for each **typical** business, apply the balance (100 - 37.7%) share of employment in small business to the relevant cost per employee portion of the formula, divided by the number of typical businesses covered by the proposal (224). Then add the fixed cost per business for lighting/power (\$7,500).  
 $[\$36 * 42,110 * (100 - 37.7\%)]/224 + [\$7,500] = \$11,716$

<sup>2</sup> Farm employment fluctuates during the year with peak employment during the harvest season. The increased need for labor is provided by intermittent workers provide by farm labor contractors. While equipment costs are sunk/fixed, the increased cost of powering additional lighting is not a year round cost. The cost estimates are for periods of peak employment, estimated to be six months for the average employer.

<sup>3</sup> Available at: [http://www.labormarketinfo.edd.ca.gov/LMID/Size\\_of\\_Business\\_Data.html](http://www.labormarketinfo.edd.ca.gov/LMID/Size_of_Business_Data.html)

<sup>4</sup> Estimated using NAICS 11 ratio of average of average estimated employment based on size category to proxy small business employment <100 to total estimated employment. Source: EDD LMI Table 2A: Third Quarterly 2016 Payroll and Number of Businesses by Size Category.

Total Cost of the Proposal.

The total statewide dollar costs that business and individuals may incur to comply with this regulation over its lifetime are estimated to be \$31.6 million in the first year and ongoing annual costs of \$24 million.

Estimated costs of compliance.

According to the National Institute for Occupational Safety and Health website, 15 million workers in the U.S. work full time on evening shift, night shift, rotating shifts, or other employer arranged irregular schedules.<sup>5, 6</sup> DIR applied this ratio of workers (10%) to 2016 EDD Market Data to estimate the percentage of California’s agricultural workforce that works at night<sup>7</sup>. There is no data available on the number of establishments that work at night covered by the proposal. But if we assume 25% of the 16,031 establishments covered by the proposal will have employees working at night at some point during the year, the total estimated industry cost for compliance with the proposal’s requirements is [ $36 * 42,110$ ] + [ $4008 * \$7,500$ ] = \$31.6 million.

<b>Description</b>	<b>Total</b>
Cost per worker	\$36
# CA night time agricultural workers	42,110
Estimated Total Cost Per Worker ( $\$36 \times 42,110$ )	\$1,515,960
Estimated Cost Per Establishment (in addition to cost per worker)	\$7,500
Establishments with employees who work at night (25% of 16,031 assumed)	4,008
Estimated Total Cost Per Establishment ( $4,008 \times \$7,500$ )	\$30,060,000
<b>Estimated Total Cost (cost per worker and cost per employer)</b> <b>(<math>\\$1,515,960 + \\$30,060,000</math>)</b>	<b>\$31,575,960</b>

The proposed regulation protects the health and safety of California workers through accident/injury prevention. It does not provide a direct benefit to the state’s environment. This proposal will have no economic impact on California businesses and more specifically not impact the following:

<sup>5</sup> NIOSH. *Work schedules: shift work and long hours*. References BLS data from 2004. Accessed 2/14/18: <https://www.cdc.gov/niosh/topics/workschedules/default.html>

<sup>6</sup> According to the United States Labor Force Statistics, there were 150 million workers (Seasonally Adjusted) for the same year. The share of workers affected is estimated to be 10%. Accessed 2/14/18: <http://www.dlt.ri.gov/lmi/laus/us/usadj.htm>

<sup>7</sup> Number of agricultural workers in 2016: <https://www.labormarketinfo.edd.ca.gov/data/ca-agriculture.html>; File located: All Areas; 2016 Annual Average Employment Data 1990–2017 Excel); Ag\_Employment\_Annual\_Average\_ca file.

- The creation or elimination of jobs within the State of California,
- The creation of new businesses or the elimination of existing businesses within the State of California, and
- The expansion of businesses currently doing business within the State of California.

### **BENEFITS OF THE PROPOSED ACTION**

Working during hours of darkness provides benefits to the agricultural industries. It saves the employer the energy cost for cooling down the crop to hold optimum temperature. It allows the employer to harvest at a time that assures them the best quality of crops possible, i.e., minimized bruising, optimum sugar and/or moisture content. In addition, working during hours of darkness usually equates to cooler temperatures, greatly diminishing the risk for heat illness. Cooler temperature increases employee comfort, which improves the productivity of workers. The proposal helps to provide a safe environment for employees when work during hours of darkness by addressing the hazards presented by limited ambient lighting.

The Board estimates benefits would be about \$36.7 million per year due to prevented accidents. The estimated benefits are based on 2,080 injury cases multiplied by \$17,622, the average workers' compensation medical and indemnity cost of agricultural injury claims in 2013 and 2014.

This estimate is conservative because there are unquantifiable additional costs imposed by the health consequences arising from these injuries for workers, employers, and society. Therefore, the benefits may be much greater than estimated due to the additional implications of related injuries. The proposed regulation will not provide a benefit to the state's environment.

### **EVIDENCE SUPPORTING FINDING OF NO SIGNIFICANT ADVERSE ECONOMIC IMPACT DIRECTLY AFFECTING BUSINESSES**

According to the California Department of Food and Agriculture, California Agricultural Statistics Review, 2015-2016, the California Agricultural industry total cash receipts for 2015-2016 was 47.07 billion and exports totaled \$20.69 billion. The total cost of \$31.6 million is approximately 0.07% of the annual cash receipts.

### **REASONABLE ALTERNATIVES TO THE PROPOSAL AND THE BOARD'S REASONS FOR REJECTING THOSE ALTERNATIVES**

#### Alternative 1: Maintain the Status Quo:

If California decides to do nothing, then employers and employees will have no prescribed criteria for determining adequate lighting. Title 8, General Industry Safety Orders, Section 3317 does not address illumination levels for outdoor agricultural operations. Section 3317 prescribes minimum illumination levels for storage yards, offices, locker rooms, loading areas, warehouse,



corridors, washrooms, spray booths, elevators, stairways, assembly areas, layout areas, engine rooms, machine shops, sheet metal works, and wood working shops. The absence of adequate lighting is expected to place agricultural workers at greater risk of injury or fatality.

Alternative 1 is rejected because the responsibility of providing adequate lighting may be shifted to employees because if the employer does not voluntarily provide adequate lighting, some employees will incur the cost of purchasing their own flashlight or headlamps and batteries.

Alternative 2: The California Farm Bureau in Sacramento proposed:

Section 3449(a)(1): Employer provision of hands-free or if appropriate hand-held personal lighting shall be deemed compliant for provision of light for meeting and meal/rest area activities and for general safety for outdoor agricultural operations during hours of darkness. If needed to comply with subsection (a), the employer shall provide and maintain hands free or, as appropriate, hand-held portable personal lighting in addition to area lighting in order to achieve the proposal's required illumination levels.

The Board rejects the Farm Bureau's proposal because the proposed language may create a false impression that hands free and portable lighting is the only solution to providing adequate lighting. The proposal prescribes illumination levels dependent on the area, task or activity. The proposal does not prescribe the type or method of lighting needed in order to achieve adequate illumination. The employer, based on their operations, can choose the combination of lighting equipment necessary to meet the prescribed illumination levels. Lighting may come from power generated lights, vehicles, industrial equipment, permanent light fixtures attached to structures, and any type of portable lighting. Hands free and other portable lights alone may not be adequate.