

State of California
Department of Industrial Relations
Division of Occupational Safety and Health
Memorandum

Date: November 20, 2020

To: Christina Shupe, Executive Officer
Occupational Safety and Health Standards Board
2520 Venture Oaks Way, Suite 350
Sacramento, CA 95833

From: Eric Berg, Deputy Chief of Health *Eric Berg*
Division of Occupational Safety and Health

Subject: Evaluation of Petition No. 580 to amend title 8 section 4001.

1.0 INTRODUCTION

On April 2, 2020 the Division of Occupational Safety and Health (Cal/OSHA) received a petition from Scott Swaaley (petitioner) of Makesafe Tools, Inc. The petitioner requests Cal/OSHA take several actions regarding the use of anti-restart devices on machinery and equipment.

Labor Code Section 142.2 permits interested persons to propose new or revised standards concerning occupational safety and health, and requires the Occupational Safety and Health Standards Board (Standards Board) to consider such proposals. California Labor Code section 147 requires the Standards Board to refer to Cal/OSHA for evaluation of any proposed occupational safety and health standard.

2.0 INFORMATION ON PETITIONER AND POWER TOOL BRAKE DEVICE

The petitioner is the CEO of Makesafe Tools Inc. that engages in the manufacturing and sales of a product known as the "Power Tool Brake" (Figure 1). The Power Tool Brake is an electric device measuring approximately 7x5x2-inches that is connected between an electrical power outlet and a piece of machinery or equipment. The petitioner began sales of the Power Tool Brake in 2018 after discovering some industrial machinery that was being provided with anti-restart devices rated for residential electrical appliances. The main function of the Power Tool Brake is preventing electric machinery and equipment from automatically restarting when power is restored following a power failure. Devices such as the Power Tool Brake are commonly referred to as anti-restart devices and function by requiring the manual operation of an electrical switch to continue operating machinery and equipment when electrical power is restored.



Figure 1. Makesafe Tools Inc. – “Power Tool Brake” anti-restart device.

3.0 PETITIONER’S REQUESTS AND BASIS FOR AMENDMENT OF TITLE 8 REGULATIONS

The petitioner requests the following in the petition application.

3.1 Proposed Change to Title 8 Section 4001

The petitioner requests that title 8 section 2530.43 of the Low-Voltage Electrical Orders be better aligned with federal OSHA regulations. To this end, the petitioner proposes that the language of title 29 Code of Federal Regulations subsection 1910.213(b)(3) be incorporated into California Code of Regulations title 8 section 4001 of the General Safety Orders. The current requirements of title 8 subsections 2540.43, 4001 and 29 CFR subsection 1910.213(b) are as follows:

California Code of Regulations Title 8 Industrial Relations

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Subchapter 5. Electrical Safety Orders
Group 1. Low-Voltage Electrical Safety Orders
Article 56. Motors, Motor Circuits and Controllers
§2530.43. Automatic Restarting.

(a) A motor-running overload device that can restart a motor automatically after overload tripping shall not be installed unless approved for use with the motor it protects.

(b) A motor that can restart automatically after shutdown shall not be installed if its automatic restarting can result in injury to persons.

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Subchapter 7. General Industry Safety Orders
Group 6. Power Transmission Equipment, Prime Movers, Machines and Machine Parts
Article 41. Prime Movers and Machinery

§4001. Machine Power Control.

All machines shall be equipped with adequate means whereby the operator of the machine or other person can disconnect the power promptly in case of emergency.

Code of Federal Regulations Title 29 – Labor

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1910 Subpart O

Machinery and Machine Guarding

1910.213 Woodworking Machinery Requirements

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(b)(3) On applications where injury to the operator might result if motors were to restart after power failures, provision shall be made to prevent machines from automatically restarting upon restoration of power.

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The petitioner did not specify in their petition how the language of 29 CFR 1910.213(b)(3) should be incorporated into title 8 and simply stated that the current federal language should be added to title 8 section 4001.

3.2 Requests Not Related to Changes of Title 8 Regulations

In addition to the change of title 8 section 4001 described in section 3.1 of this evaluation, the petitioner also requests that Cal/OSHA take the following action:

1. Work with Nationally Recognized Test Laboratories (NRTL) and anti-restart device manufacturers to withdraw listings by Underwriter’s Laboratory (UL) for anti-restart devices currently listed under UL244A for appliance controls and transition these products into UL508 anti-restart devices for industrial applications.
2. Publish a general notice for businesses that anti-restart devices listed under UL244A present a safety hazard if used on industrial machinery with higher voltage and current ratings and include in the notice available options for mitigating unintentional restarts.
3. Require manufacturers of anti-restart devices that are not NRTL listed for safe use with industrial motors and machinery to explicitly state such on the device’s product literature and labeling.

3.3 Petitioner’s Bases for Requests

The basis for the petitioner’s requests is the potential hazards of utilizing anti-restart devices that are not appropriately listed by a NRTL or approved for the end use. After a customer of MakeSafe Tools, Inc informed the petitioner of a high failure rate of anti-restart devices that had been purchased from other companies, the petitioner identified that many anti-restart devices on the market are listed or approved for use with appliances but not industrial machinery.

The petitioner argues that the lower fire ratings of devices intended for residential appliances can lead to failure from overheating when it is used with industrial machinery which have large electrical motors that operate with higher voltages and currents resulting in excessive heat. The petitioner asserts that certain anti-restart devices currently being used were sold to end users under an Underwriters Laboratory (UL) listing that are not correctly categorized.

The result of using incorrectly listed UL equipment, the petitioner explained, is failure from overheating and possible fire. In a telephone conversation with Cal/OSHA staff, the petitioner stated that the following anti-restart devices illustrated in Figures 1 and 2 below are rated for appliances but are marketed for use with industrial motors.



Figure 2. JDS Products Inc. – “Sensing-Saf-Start” anti-restart device.



Figure 3. Safe Start Systems – “Safetygate Professional” anti-restart device.

4.0 ADDITIONAL APPLICABLE TITLE 8 REGULATIONS

Section 2305.4 of the title 8 Low-Voltage Electrical Safety Orders includes the requirement and definition for the low-voltage electrical systems to be approved for their use.

Subchapter 5. Electrical Safety Orders
 Group 1. Low-Voltage Electrical Safety Orders
 Article 2. Administration

§2305.4. Approvals.

The conductors and equipment required or permitted by these orders shall be acceptable only if approved.

(a) When the term "approved" is used in these orders, it shall refer to products, materials, devices, systems, or installations that have been approved, listed, labeled, or certified as conforming to applicable governmental or other nationally recognized standards, or applicable scientific principles. The approval, listing, labeling, or certification of conformity, shall be based upon an evaluation performed by a nationally recognized testing laboratory recognized pursuant to 29 CFR §1910.7, which is incorporated by reference; or by a person, firm, or entity with appropriate registered engineering competence or by a person, firm, or entity, independent of the manufacturer or supplier of the product, with demonstrated competence in the field of such evaluation.

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Title 8 subsection 4002(a) requires all hazardous parts of machinery and equipment other than the point of operation to be guarded.

Subchapter 7. General Industry Safety Orders
 Group 6. Power Transmission Equipment, Prime Movers, Machines and Machine Parts
 Article 41. Prime Movers and Machinery

§4002. Moving Parts of Machinery or Equipment.

(a) All machines, parts of machines, or component parts of machines which create hazardous revolving, reciprocating, running, shearing, punching, pressing, squeezing, drawing, cutting, rolling, mixing or similar action, including pinch points and shear points, not guarded by the frame of the machine(s) or by location, shall be guarded.

* * * * *

Title 8 subsection 4296(q) is already identical to the federal OSHA regulation 29 CFR 1910.213, which the petitioner requests be added to title 8 section 4001.

Subchapter 7. General Industry Safety Orders
Group 8. Points of Operation and Other Hazardous Parts of Machinery
Article 59. Woodworking Machines and Equipment
§4296. General.

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(q) On machinery and equipment where injury might result if motors were to automatically restart after power failures, provision shall be made to prevent machines and equipment from automatically starting upon restoration of power.

Exception: Portable power tools intended to be handheld during use.

Note: For the purpose of subsection (q), the term "provision" means electrical or mechanical device, or administrative procedures.

5.0 APPLICABLE CONSENSUS STANDARDS

5.1 Underwriters Laboratory (UL)

Underwriters Laboratory (UL) includes requirements for electronic controls including anti-restart devices for appliances and industrial equipment in their 244A and 508 standards respectively. The scopes of the third edition of UL 244A and eighth edition of UL 508 are listed below. Neither of these standards are included by reference in title 8 regulations and were not obtained for this evaluation.

Standard for Safety Solid-State Controls for Appliances UL 244A

1 Scope

1.1 These requirements cover component electronic controls intended to be factory installed on or in appliances and other utilization equipment rated 600 V or less, used in ordinary dry locations as defined in the National Electrical Code, NFPA 70, and that comply with the requirements for such appliances and equipment.

1.2 For a control covered by this standard, it is assumed that:

- a) No voltage greater than 600 V above ground will be present in a control,
- b) An isolation transformer, if provided, will generally furnish power at a lower potential than the primary voltage, and
- c) The output of the control will not be located in a circuit operating at greater than 600 V above ground in the end-use product.

If conditions other than these are provided, consideration shall be given to the need for additional requirements.

1.3 A control covered by this standard is a single device or a series of separate components with interconnecting wiring employing one or more input

power and possibly signal ports, solid-state circuitry, and one or more output switching components to directly control all or a portion of the end-use product load. Included are controls that respond directly or indirectly to changes in temperature, humidity, or pressure to affect operation of an appliance, function as an electronic timer, or electronically store or process information by virtue of a memory system.

1.4 These requirements cover controls intended for connection only to a low-voltage circuit of limited power supplied by a primary battery or by a Class 2 transformer, where a failure of such a control would result a risk of fire, electric shock, or injury to persons in the end-use product.

1.5 These requirements do not cover a control intended for installation in or on refrigeration or air conditioning equipment that is used in industrial applications or in hazardous locations as defined in the National Electrical Code, NFPA 70. Such equipment is covered in the Standard for Temperature-Indicating and -Regulating Equipment, UL 873. Compliance with the Standard for Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements, UL 60730-1, and/or the applicable Part 2 standard from the UL 60730 series fulfills these requirements.

1.5 revised March 4, 2010. UL 873 will be withdrawn on October 19, 2016.

1.6 These requirements do not cover controls for use where exposed to oil, grease vapors, lint, other contaminants, or high humidity in the end application.

1.7 These requirements address the potential risks unique to the electronic nature of a control. Equipment or components employing an electronic feature shall also comply with the basic requirements contained in the applicable end-product or component standard. These requirements are intended to supplement applicable end-product or component standards and are not intended to serve as the sole basis for investigating all risks associated with a control. For example, requirements for the means of enclosing live parts, mechanical assembly of components, corrosion protection, use of polymeric materials, evaluation of internal wiring and connections within the control, calibration, and similar requirements, are not included in this standard.

Standard for Safety Industrial Control Equipment UL 508 - 2018

1 Scope

1.1 These requirements cover industrial control devices, and devices accessory thereto, for starting, stopping, regulating, controlling, or protecting electric motors. These requirements also cover industrial control devices or systems that store or process information and are provided with an output motor control function(s). This equipment is for use in ordinary locations in accordance with the National Electrical Code, NFPA 70. These requirements do not include requirements for the evaluation of equipment intended for use in functional safety applications.

1.2 These requirements cover devices rated 1500 volts or less. Industrial control equipment covered by these requirements is intended for use in an ambient temperature of 0 - 40°C (32 - 104°F) unless specifically indicated for use in other conditions.

1.3 Examples of industrial control devices described in 1.1 are:

- a) Manual, magnetic, and solid-state starters and controllers.
- b) Thermal, magnetic, and solid-state overload relays.
- c) Pushbutton stations, including selector switches and pilot lights.
- d) Control circuit switches and relays.

- e) Float, flow, pressure, and vacuum-operated switches.
- f) Resistors and rheostats.
- g) Proximity switches.
- h) Time-delay relays and switches.
- i) Resistors and rheostats intended for industrial heating and lighting, including those for motor generator fields.
- j) Control devices intended for industrial heating and lighting.
- k) Solid-state time-delay relays.
- l) Programmable controllers.
- m) Numerical control systems.
- n) Lighting dimmer systems and controls.
- o) Mercury-tube switches.
- p) Definite purpose controllers.
- q) Solid-state logic controllers.
- r) Industrial microprocessor/computer systems.
- s) Variable voltage autotransformer.
- t) Motor starting autotransformer.

5.2 NFPA 70 NATIONAL ELECTRIC CODE (NEC)

The National Fire Protection Association (NFPA) includes requirements for automatic restarting devices in the NFPA 70 National Electric Code (NEC) standard. The 2017 edition of NFPA 70 includes requirements for overload and automatic restarting devices in sections 430.31 and 430.34 of Part III of the standard. NFPA 70 is not included by reference in title 8 regulations.

Part III. Motor and Branch-Circuit Overload Protection

Section 430.31 General. Part III specifies overload devices intended to protect motors, motor-control apparatus, and motor branch circuit conductors against excessive heating due to motor overloads and failure to start.

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Section 430.43 Automatic Restarting. A motor overload device that can restart a motor automatically after overload tripping shall not be installed unless approved for use with the motor it protects. A motor overload device that can restart automatically after overload tripping shall not be installed if automatic restarting of the motor can result in injury to persons.

6.0 RULE MAKING HISTORY

In 1999, Dave Jacobs of JDS Products Inc. filed a petition (file #397) with the Standards Board to revise section 2530.43 regarding automatic restarting of motors on machines and equipment. JDS Products Inc. is a manufacturer and vendor of an anti-restart device. In petition file number 397, the petitioner requested to separate section 2530.43 into two subsections to provide clarification that a motor may not be allowed to restart if it could injure employees. The petition was granted and a revision was processed as a change without regulatory effect under Section 100 of the California Administrative Procedure Act.

During the rule making process for petition file #397, the Standards Board staff discovered title 8 regulations were not as effective as CFR 1910.213(b)(3). CFR 1910.213(b)(3) was promulgated by Fed-OSHA in the 1970's after recognizing the hazard in the woodworking machinery. The intent of CFR 1910.213(b)(3) was to prevent machines from automatically restarting upon restoration of power if such

restoration might cause operator injury. The Standards Board promulgated title 8 section 4296(q) to be as effective as federal regulations and became operative on October 5, 2001.

7.0 ANALYSIS

7.1 Change to Title 8 Section 4001 is Unnecessary

The petitioner's proposed amendment of title 8 section 4001 is not necessary to "align" title 8 with federal OSHA regulations. Title 8 subsection 4296(q) (see text in part 4.0 of this evaluation) is already identical to 29 CFR subsection 1910.213(b)(3). Both the federal and title 8 subsections apply only to woodworking equipment.

Additionally, the proposed change to title 8 section 4001 is not necessary because the hazards created by the restarting of motors regulated by section 4001 are currently addressed by other title 8 orders.

Section 4001 resides in Group 6 of the General Industry Safety Orders and applies to power transmission equipment, prime movers and parts of machinery other than the point of operation. Title 8 section 4002 of the Group 6 orders currently requires the guarding of hazardous moving parts of machinery and equipment.

Therefore, the automatic restarting of motors after power failure would not create a hazard for components of machinery included in the Group 6 orders if guarded as required by section 4002. Additionally, title 8 section 3314 requires the locking and/or tagging of machinery and equipment power sources during cleaning, repairing, servicing, setting-up, and adjusting operations. As a result, the proposed amendment to section 4001 is not necessary.

7.2 Title 8 Regulations Currently Require Approval of Anti-restart Devices

The petitioner's concern regarding the use of anti-restart devices that are not approved for use with industrial machinery is already addressed by title 8 regulations. Pursuant to title 8 subsection 2305.4(a) (see text in part 4.0 of this evaluation) of the Low-Voltage Safety Orders, all conductors and equipment must be approved for their use by a nationally recognized testing laboratory or other entity with registered engineering or demonstrated competence to perform such evaluation.

7.3 Anti-Restart Devices are not Required for All Electric Motors

Electric motors are used extensively in all segments of industry. Currently, title 8 regulations do not require all industrial electric motors to be equipped with an anti-restart device. Pursuant to both title 8 sections 2530.43 and 4296(q), machinery that cannot injure a worker when automatically restarting is not required to be equipped with an anti-restart device. An example of this type of machinery is an electric motor running a buffing wheel with a soft cloth attachment for polishing. Despite the fast spinning wheel, a worker who makes contact with the soft buffing cloth would not be injured. The opposite extreme would be a table saw. The blades of some table saws spin at very high revolutions per minute making it indiscernible that the blade is moving. Coupled with a quietly running electrical motor,

a table saw in this situation can seriously injure an operator who unknowingly makes contact with the running saw blade or if material flies or the work piece kicks back, striking the operator.

Additionally, title 8 section 2530.43 only requires low-voltage electric motors to have anti-restart functionality for shutdown due to overloading. During the 2001 rulemaking for Petition #397 discussed in part 7 of this evaluation, the Standards Board concluded that the requirements of section 2530.43 was adopted nearly verbatim from section 430-43 of the 1999 edition of NFPA 70. This section more clearly states that motors are not to restart following overload tripping and hence it was the intent of title 8 section 2530.43 to apply to the restarting of motors due to overload conditions.

Unlike title 8 section 2530.43, subsection 4296(q) applies to the restarting of machinery when power is restored after power failures. However, as this subsection is included in Article 59, the requirement applies only to woodworking machinery equipment. Therefore, other types of machinery such as metal working machines and power operated presses are not required to have an anti-restart device. Such equipment also has the potential to cause injury upon restarting when power is restored following a power failure but is not currently addressed by title 8 regulations.

7.4 Some of the Petitioner's Requests Fall Outside of the Petition Process and the Jurisdiction of Cal/OSHA

Several of the requests within the petitioner's application, discussed in part 3.2 of this evaluation, are not germane to the petition process or are not within the scope of Cal/OSHA's jurisdiction. The petitioner's requests for Cal/OSHA to work with NRTLs and manufacturers to withdraw consensus standard listings does not propose any change to title 8 regulations. This request would be better directed to the Cal/OSHA Consultation Service. Likewise, the petitioner's request to publish notices to the public regarding the hazards related to the misuse of anti-restart devices does not include any petition for new or amended regulation and would be better addressed by Cal/OSHA Communications and Publications Units.

The petitioner's request to require manufacturers of anti-restart devices to state explicitly when their devices are not rated for industrial machinery does not fall within the scope of Cal/OSHA's jurisdiction. Pursuant to California Labor Code section 6300, Cal/OSHA may only exercise jurisdiction when an employer-employee relationship exists.

Although most manufacturers are also employers, the products they manufacture can be sold to parties or entities who are not employers. Therefore, explicitly dictating the content of the manufacturer's documentation would be acting in excess of Cal/OSHA's authority to enforce title 8 regulations.

8.0 CONCLUSION

Cal/OSHA recommends that the petition be denied. However, Cal/OSHA supports convening an advisory committee to determine if employee safety could be enhanced by the requirement for anti-restart devices on other machinery not currently addressed by title 8 regulations.

cc: Yancy Yap
Jason Denning