OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION
1120 20th Street, N.W., Ninth Floor
Washington, DC 20036-3457

SECRETARY OF LABOR, **Complainant,** **v.** **ALRO STEEL CORPORATION** **Respondent.**	**OSHRC DOCKET NO. 13-2115**

Appearances:

Linda Hastings, Esquire
U.S. Department of Labor, Office of the Solicitor, Cleveland, Ohio
For the Complainant.

James P. Silk, Jr., Esquire
Susan B. Nelson, Esquire
Spengler Nathanson, P.L.L., Toledo, Ohio
For the Respondent.

Before: Carol A. Baumerich
Administrative Law Judge

DECISION AND ORDER

This proceeding is before the Occupational Safety and Health Review Commission pursuant to section 10(c) of the Occupational Safety and Health Act of 1970, 29 U.S.C. §§ 651-678 ("the Act"). Following a site specific target inspection of Respondent's worksite at 3003 Airport Highway, Toledo, Ohio 43609, the Occupational Safety and Health Administration ("OSHA") issued a one item serious citation, with subparts, to Alro Steel Corporation ("Alro," "Respondent," or "employer"), alleging violations of OSHA's standards regarding the control of hazardous energy (lockout / tagout)("LOTO") during blade changing activities on the Amanda and HEM band saws.

The citation was issued on November 14, 2013. The Secretary proposed a combined penalty of $4,250 for the violations. Alro filed a timely notice of contest, bringing this matter before the Commission. A hearing was held in Toledo, Ohio, on October 15-16, 2014.[1] Both parties filed post-hearing briefs and reply briefs.[2]

For the reasons set forth below, the citation is vacated.

Jurisdiction

Based upon the record and the parties' stipulations, I find that at all relevant times Alro was engaged in a business affecting commerce and was an employer within the meaning of sections 3(3) and 3(5) of the Act. (Tr. 8; Sec'y Br. p. 4; Answer paras. 2, 3, 4, 5 & 6). I also find that the Commission has jurisdiction over the parties and subject matter in this case.

Citation

Citation 1, item 1(a) alleges a serious violation of 29 C.F.R. § 1910.147(c)(4)(i). This item alleges that, on or about July 10, 2013, the employer did not ensure that energy control procedures were utilized to control hazardous energy when employees engaged in blade changing activities on (a) the Amada (Model HA-250W) manufactured horizontal band saw and (b) the HEM, Inc. (Model V125HA-1) #1191 ("HEM")[3] manufactured vertical band saw. Employees were exposed to caught-in and amputation hazards if either identified saw were to unexpectedly start while changing the machine's blade. The cited standard provides in relevant part that:

> *Energy control procedure*. Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this section.

Citation 1, item 1(b) alleges a serious violation of 29 C.F.R. § 1910.147(d)(3). This item alleges that, on or about July 10, 2013, the employer did not ensure that employees isolated energy sources prior to engaging in blade changing activities on (a) the Amada manufactured

[1] The parties were reminded that the decision would be based on the official record, the testimony and exhibits offered and received into evidence at the hearing. (Tr. 7-8). Any documents not received into evidence at the hearing remain outside the official record and were not considered in reaching the decision in this case. Commission Rules do not provide for parties to file discovery, including prehearing depositions, with the Commission. *See* Commission Rules 8, 52(j), 29 C.F.R. §§ 2200.8, 2200.52(j).

[2] In its Answer, Alro raised several affirmative defenses which it did not pursue at the hearing or in its post-hearing briefs. I deem these affirmative defenses to be abandoned. *See Georgia-Pacific Corp.*, 15 BNA OSHC 1127, 1130 (No. 89-2713, 1991).

[3] Throughout the proceeding, the parties referred to this saw as the "HEM" or the "HE&M." For purposes of this decision, the saw will be referred to as the "HEM."

horizontal band saw and on (b) the HEM manufactured vertical band saw. Employees were exposed to caught-in and amputation hazards if either identified saw were to unexpectedly start while changing the machine's blade. The cited standard provides in relevant part that:

> *Machine or equipment isolation*. All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).

Factual Background

In July 2013, OSHA Compliance Officer James McManus (the "CSHO") conducted a site specific inspection of Alro's facility in Toledo, Ohio.[4] During the inspection the CSHO reviewed multiple band saws at Alro's facility. (Tr. 8-9, 16). He observed two saws relevant to this matter: an Amada horizontal band saw (Tr. 21, 66, Exs. C-2, C-3) and an HEM vertical band saw (Tr. 25-27, Exs. C-8, C-9). The CSHO identified the energy sources on the Amanda and HEM as electric and hydraulic. (Tr. 30-31; Exs. C-3, C-15, C-16).

The CSHO learned that both saws periodically require blade changes. (Tr. 22, 25, 39). Depending on the nature of the stock being cut, the saws could require multiple blade changes a day or not require a change for several days. (Tr. 39-40, 46, 48, 53-54). Alro had a written saw blade lockout procedure.[5] (Tr. 37, 51-52; Ex. C-17). There is no evidence that Alro's Amanda and HEM band saws ever unexpectedly energized during blade changing activities. (Tr. 62-63).

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[4] McManus has been an OSHA Compliance Officer since October 2009. He received the standard training given to compliance officers, including multiple LOTO seminars. Working with OSHA he recalled conducting approximately 40-50 LOTO inspections, of which two or three concerned band saws. He has no specific training in either electrical or mechanical engineering and no training in reading schematics. (Tr. 14-16, 58).

[5] The written saw blade lockout procedure states, in pertinent part:

> **Quality Procedure: T1 – Saw Blade Change Lockout (Rev. B).**
> **The following steps MUST be taken prior to making a blade change on a saw.**
> Ensure motor button is "off".
> Place Lockout cover over motor button.
> Apply lock to motor button lockout cover.
> Keep key in your possession till lock is to be removed.
> Ensure motor button cannot be turned on.
> Now you may change the blade.
> When Blade Change has been completed.
> Remove Lock, then place lock and key back on hook on desk.
> Flip lockout cover back in unlock position.
> **An entry in the Saw Blade Change Lockout Log is required**.
> Resume sawing. (Ex. C-17).

The CSHO did not observe a blade change on the Amanda or HEM. During the inspection an employee described the blade change procedures to the CSHO. (Tr. 30-32, 63, 81-82; Ex. C-18).

At the hearing, the blade changing procedures for both machines were explained. For the HEM band saw, the operator turns off the machine motor by turning the "start" switch to the off position, places a plastic safety cover over the "start" switch located on the machine operating control panel[6], locks the cover in place with a single key, and places the key in his pocket. The key remains in the possession of the operator performing the blade change. The operator then walks from the control panel to the top and bottom wheel cabinets, checks to make sure that the limit switches on the wheel covers are working. With his left hand the operator de-tensions the blade at the de-tension switch located on the left side of the cabinet, causing the upper wheel to move closer to the lower wheel, which loosens the blade. After the band saw tension is loosened, the operator opens the cabinets. The operator removes the old blade. The operator then puts on the new blade. The operator positions the blade over the top wheel, holding the blade with his right hand somewhere close to the middle of the blade[7] and holding the bottom of the blade with his foot. While holding the blade, with his left hand the operator adjusts the tension using the tension switch and adjusts the guide screws to align the blade. He then closes the upper and lower cabinet wheel covers. When the cabinet doors close the interlocks are in place. When the doors are closed he fully tensions the blade. He walks back to the control panel, unlocks and removes the safety cover over the "start" switch, activates the other buttons to

[6] Respondent's expert witnesses who observed employees change the HEM and Amanda saw blades, at a time following the inspection, in preparation for the hearing regarding this citation, described somewhat different blade change procedures than described to the CSHO during the inspection and set forth in Alro's written saw blade lockout procedure provided to the CSHO during the inspection. *Compare* Tr. 27, 32-35, 50, 63-64, 68-71, 73, 78-79, 82; Exs. C-17, C-18 *with* Tr. 105, 146, 150, 186-88. Where the blade change procedure described by Respondent's witnesses differs from the procedure described to the CSHO and the written procedure provided to the CSHO, the different blade change descriptions of Respondent's witnesses are given little weight as they do not reflect the procedure at Alro's facility on the day of the inspection.

Respondent's expert witness Hayes visited Alro's facility and observed blade changes on the Amanda and HEM band saws. During his visits and observations, at no time did Alro provide to Hayes the written lockout procedures, including the saw blade lockout procedure, provided to the CSHO during the inspection. Rather, Alro gave Hayes a different written lockout procedure. (Tr. 128-36, 150-51; Exs. C-15, C-16, C-17). Hayes admitted that employees on other shifts might use different blade change procedures than the procedures he observed. (Tr. 127-28, 134). Likewise, prior to the hearing, Respondent's expert Curtis had not seen Alro's written lockout procedures provided to the CSHO during the inspection. (Tr. 224-25).

[7] Hayes testified that when he observed a blade change on the HEM, the operator held the de-tensioned blade to place it on the upper wheel, however, the operator did not "hold on" to the blade. (Tr. 118-19, 142-43). For the reasons stated in note 6 above, greater weight is given to the CSHO's testimony regarding the blade change procedure described to him on the day of the inspection.

energize the machine and re-boots the computer.[8] (Tr. 27, 32-35, 50, 63-64, 68-71, 73, 78-79, 82, 104-07, 112, 118-19, 158-59; Exs. C-11, C-12, C-13, C-17, C-18; R-A3, R-A6).

When changing the blade on the Amanda band saw, Alro's procedure was to turn off the drive blade by pushing the drive blade motor or "start" button, place a plastic safety cover over the drive blade "start" button located on the machine operating control panel, and lock the cover in place with a key. The key remained in possession of the operator performing the blade change.[9] (Tr. 22, 24, 73, 114; Exs. C-5, C-6, C-7, C-17, C-18). At the hearing, Respondent's expert Hayes described the blade changing procedure on the Amanda band saw as essentially the same procedure as on the HEM. (Tr. 114). After locking the control panel button, the operator moves to the machine which is five feet away, turns a crank on the handle to de-tension the wheel, lifts up the wheel guard covers, removes the blade, puts the new blade on, and then reverses the steps. There are no interlocks on the Amanda. (Tr. 113-115, 138).

A blade change is a service and maintenance activity. The CSHO testified that Alro did not have employees use LOTO compliant procedures when changing saw blades. As Alro's blade change procedure did not provide for the saws to be isolated from the energy source, the procedure failed to comply with the LOTO standard. Reliance on push buttons and limit switches is not compliant with the LOTO standard. (Tr. 25, 31, 40-43, 51-56. *See* Tr. 296).

The CSHO testified that Alro had written LOTO compliant procedures in place for other service and maintenance activities on the Amanda and HEM band saws that required the band saws to be isolated from the energy source. (Tr. 25, 36-37; Exs. C-15, C-16). To isolate the band saws from the energy source, the machines were de-energized at the main electrical disconnect switch. Alro did not have employees utilize the complaint LOTO procedures when changing the blades. (Tr. 21, 26, 51-53; Exs. C-4, C-10). Neither the Secretary nor Respondent explained why this compliant procedure was not used during blade changes.[10] (Tr. 225-26).

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[8] The HEM also has a remote control panel associated with the conveyor portion of the machine. (Tr. 222).

[9] The Secretary provided few additional details regarding the Amanda band saw blade change procedure. The CSHO did not know where the operators position their hands during the blade change on the Amanda. (Tr. 68).

[10] At the closing conference, the reason for Alro's alternative lockout procedure for blade changes was explained to the CSHO. On the HEM the actual saw drive motor is on the electric system, but the blade tension is on the hydraulic system. Respondent was concerned that if the power was shut down at the main disconnect they would lose the ability to use the hydraulic pumps to tension the blades. (Tr. 39. *See* Tr. 297-98, 303-04. *See also* Tr. 214, 225-26). This reason also is set forth in Respondent's notice of contest. At the hearing and in Respondent's post hearing briefs, Respondent did not articulate or advance this reason. Respondent did not raise infeasibility as an affirmative defense. Further, Respondent did not assert that its compliant LOTO procedures could not be applied to either saw during blade changes.

The CSHO testified that there was no stored energy or capacity for stored energy in the Amanda or HEM saws. Stored energy, including hydraulic energy, was not a concern. (Tr. 42, 51, 62). The CSHO further testified that Alro's blade change lockout procedure adequately addressed the potential hazard of the operator or someone other than the operator inadvertently or mistakenly hitting the start button to activate the machine while the operator was performing the blade change. During the blade change the motor or "start" button was covered and locked and the operator retained the key. Accidental start up by the operator or someone other than the operator was not a concern. (Tr. 41-42, 50-51, 73). The CSHO's concern regarding Alro's blade change lockout procedure was that the machine remained energized and, therefore, the potential remained for the equipment to start unexpectedly. The CSHO testified that Alro was simply relying on the limit switch to interrupt the contactors to prevent the equipment from starting unexpectedly. The LOTO standard prohibits reliance on control circuitry. (Tr. 41-47).

The CSHO testified that it was not necessary for him to read the schematics for the cited saws because the machines were required to be, but were not, isolated from the energy source. (Tr. 59, 62). Likewise, the CSHO did not read the operating instructions for either saw. (Tr. 59). The CSHO generally testified that there are many examples where a limit switch failed and a piece of equipment started unexpectedly. (Tr. 43, 72).

The CSHO testified that if the saw was to unexpectedly start during a blade change, using Alro's procedure, while the operator was positioning the blade or adjusting the tension or guide screws, the operator's hands, and regarding the HEM saw the operator's foot, would be in the danger zone. Should the machine unexpectedly start the operator could receive a serious laceration or an amputation resulting in a permanent disability. During a blade change, if the saw unexpectedly started, with the rotating wheels, an employee's clothing or fingers could get caught resulting in a serious caught-in injury. With an unexpected startup, on the HEM saw, if

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The CSHO testified that Arlo could have a compliant LOTO procedure for blade changes that did not require the HEM to be locked out at the main disconnect. Alro could place a secondary disconnect to cut power to the drive motor, thereby eliminating unexpected machine start-up, while allowing hydraulic power to operate. This procedure would be LOTO compliant. (Tr. 60).

Respondent's expert Hayes testified that when the HEM band saw power motor is disconnected and the wheel covers opened to change the saw blade, the HEM tensioning device is not needed until blade is in position on the wheels and the wheel covers are closed. According to Hayes' description of the HEM blade change activity, disconnecting the electric machine power at the main disconnect when changing the blade would not interfere with the hydraulic motor needed to tension the blade. (Tr. 106-07, 109, 112, 151, 159-60, 297-99). As stated in note 6 above, the procedure Hayes observed was somewhat different from the procedure described to the CSHO on the day of the inspection and, therefore, is accorded little weight.

the blade were to unexpectedly come off the wheel, the employee could be exposed to a struck-by hazard. The CSHO agreed that the blade would not likely come off the wheel if the blade was de-tensioned. (Tr. 35, 45-50, 53-54, 57, 64-67, 75).

Expert Testimony

The Secretary called one expert witness, James Washam. Respondent presented two expert witnesses, Richard Hayes and Bryan Curtis.

1. James Washam[11]

The Secretary's expert witness, James Washam, is the machine guarding and LOTO coordinator for OSHA Region 5. (Tr. 268). His functions include coordinating activities among all the Region 5 OSHA area offices on machine guarding and LOTO issues. (Tr. 268-269). He assists the area offices in accident investigations, including advising them on the proper standards to cite. (Tr. 269). Washam developed an OSHA Region 5 LOTO and machine guarding course and traveled to all Region 5 OSHA area offices to train compliance officers. (Tr. 271). He also assists the Solicitor in contested LOTO cases. (Tr. 269). Before becoming

[11] Washam was identified as the Secretary's expert witness prehearing. Thereafter, Respondent advanced several arguments to preclude Washam's testimony. Respondent's multiple requests to preclude testimony from the Secretary's designated expert are denied.

Respondent's motion *in limine* to exclude Washam's testimony was denied in a written Order prehearing. (Tr. 10, 284, 290-91). The Order stated that Washam would be permitted to testify as his apparent experience, technical and specialized knowledge may "help the trier of fact to understand the evidence or to determine a fact in issue." *See* Fed. R. Evid. 702(a). The Order further stated that at the hearing, Washam's testimony would be received and weighted appropriately.

It is undisputed that prehearing and again at the beginning of the hearing, the Secretary clearly advised Respondent that Washam would be called as a witness in the Secretary's rebuttal case, not in the Secretary's case in chief. (Tr.12, 83, 267-68). Respondent raised no timely objection. Prior to the Secretary's rebuttal case, Respondent articulated no objection to the Secretary's clearly stated intention to call Washam as a rebuttal witness. (Tr. 12, 83, 267-68, 281-84). Respondent's late objection to Washam's rebuttal testimony, *an objection withheld and unstated until the Secretary's rebuttal case began*, was denied. Washam was permitted to testify on rebuttal in response to the expert testimony elicited by Respondent in its defense case. (Tr. 281-84, 288-91). Respondent did not present a rebuttal case. (Tr. 308-09).

In a post hearing motion for reconsideration, Respondent renewed its objection to Washam's testimony. The Secretary opposed Respondent's motion. For the reasons set forth in the prehearing Order denying Respondent's motion *in limine* and as articulated on the record, Washam's testimony is received. Respondent's motion for reconsideration is denied. Prehearing Washam was identified as the Secretary's expert witness. Washam's expert report was provided to Respondent. At the hearing, Respondent had a full opportunity to examine Washam on *voir dire* and cross examination and to challenge the basis for his opinions. Respondent had an opportunity to raise objections during Washam's direct examination by the Secretary. Respondent's claimed prejudice based on Washam's rebuttal testimony is not supported by the record.

The Commission has a long stated preference to decide cases on their merits. *See Jersey Steel Erectors*, 16 BNA OSHC 1162, 1166-67 (No. 90-1307, 1993); *Duquesne Light Co.*, 8 BNA OSHC 1218, 1221 (No. 78-5034, 1980)(consolidated). Washam's full testimony on *voir dire*, direct, and cross examination has been considered in determining the appropriate weight his testimony has been accorded.

the machine guarding and LOTO coordinator, he was a supervisor in the Cincinnati OSHA area office for ten years. Prior to becoming a supervisor, Washam was a compliance officer. (Tr. 269-70). Prior to his retirement, he served on several ANSI committees. (Tr. 274).

After temporarily retiring from OSHA in 2007, he did consulting work for companies, conducting LOTO courses, employee training, and performing LOTO and machine guarding audits. The LOTO training included component failure possibilities and control reliable safety systems. By contract, Washam developed LOTO courses for the OSHA Training Institute in Chicago and for the OSHA education centers throughout the country for private sector companies. (Tr. 270-71, 275-76, 280).

Washam previously testified before the Commission, for OSHA, as an expert witness in LOTO and machine guarding. (Tr. 273, 277). Washam has no education or training in electrical or mechanical engineering. (Tr. 278). Washam's testimony was received as an expert in LOTO and machine guarding. (Tr. 284).

Washam has never been to Respondent's facility and did not rely on either the operator's manual or the schematics for either saw in forming his opinion. Indeed, in his view, it was not necessary to review schematics. (Tr. 279, 304). He testified that schematics are just a diagram of the control circuitry and are not relevant to whether the control circuity was isolating the machine from the energy source. (Tr. 304-05).

Washam disagreed with the opinions of Respondent's experts. Washam opined that both the Amanda and HEM band saws would be subject to unexpected startup, when using Alro's saw blade change lockout procedure. (Tr. 288-90). If the individual contact components failed in an open position, Washam opined that there were circumstances when the machine could unexpectedly startup. (Tr. 289-94).

Washam testified that there are a number of ways control relays and interlock switches can fail. For example, on an older piece of equipment parts can become loose. He had a personal experience where vibrations caused the contacts on a machine to touch, closing the circuit, and causing the machine to start. (Tr. 292-293). Moisture, metal chips, or dirt can enter the small air gaps on a control relay, between the contacts, and close the circuit to start the motor. (Tr. 293-94). Also, a short circuit in a control circuit may occur if the insulation between two wires is damaged. The short circuit can send a start signal to the motor contactor in the power circuit to

close the contacts and start the motor. He testified that interlock switches may fail in the same manner. (Tr. 294, 299-301).

Washam explained that there is a recognized potential for control circuitry, control relays, motor contactors, or other stopping mechanisms to fail. Control reliability is a system design to limit the probability of failure. Some manufacturers for control reliability install redundant safety circuit components, such as redundant control relays and redundant motor contactors. The theory behind the redundancy is that the chance of two components failing at the same time is remote. However, without a monitoring system of the safety circuit to detect a single failure, the initial failure will go undetected, and it will be just a matter of time until the second component fails. To monitor the components, a safety relay, which monitors dual channel inputs, will be installed and will shut off the system if a single failure is detected, thereby ensuring that there are always two components working at the same time. (Tr. 285-87).

Washam opined that the Amanda and HEM band saws did not include control reliability due to their age. Also, without specific reference to the band saws at issue in this proceeding, Washam testified that manufacturers normally do not put control reliable safety circuits in band saws because they are a basic machine tool. Control reliability is basically an electronic safeguard. (Tr. 287-288).

In Washam's view, the control relay is probably the weakest link in the system. When the machine is off, if a maintenance employee opens the control panel, pushes the restart button or the control relay bypass button, the control relay contacts will close and send a signal to the electrical motor contactor to close and start the motor. (Tr. 292).

Washam also testified that mechanical and electrical components have a life span. (Tr. 294-95). Moisture or current may accelerate the end of the life cycle of mechanical moving parts. (Tr. 295). Control relays should be regularly inspected so potential problems that may cause the relay to fail are detected before the end of the relay's life cycle. (Tr. 295-96).

Washam testified that the LOTO standard states that control circuit devices, such as selector switches, e-stops, and other start / stop buttons, are not energy isolating devices, because they only interrupt a circuit, they don't isolate it. With a control circuit device there is still full power to the machine. The current is still there waiting for certain contacts to close. To isolate power to the machine the disconnect should be pulled. With the disconnect pulled for the

electrical power, there is no power available to the equipment, so there is no concern about components failing and the machine starting up. (Tr. 296-97).

Since the motor electrical energy for the band saw is not isolated during Alro's blade changing procedure, the unexpected energization or startup of the motor could cause severe lacerations to employees performing the blade change. (Tr. 305). The saws were not de-energized according to the standard and as a result there could be potential failures in control relays that could cause unexpected energization. (Tr. 305).

With LOTO there is always the potential for unexpected energization of a machine if it is not de-energized and locked out. The machine can be de-energized by pulling and opening up a disconnect switch, putting a lock on it or opening a circuit breaker and putting a lock on the circuit breaker to isolate incoming power conductors to the equipment, before the power and current get to the equipment. Control circuitry does not remove the potential for unexpected energization. (Tr. 308).

2. *Richard Hayes*

Richard Hayes is a journeyman level high voltage electrician. He is a former OSHA compliance officer and former safety supervisor / Assistant Area Director. (Tr. 86-87). After 16 years with OSHA, he left to start his own company, Hayes Environmental Services, Inc. (Tr. 87). He was hired by the Department of Energy to inspect all 18 nuclear weapons labs throughout the United States. From 1994-2000 he was hired by the Coast Guard to teach the LOTO portions of the OSHA 10 hour and 30 hour certification courses. (Tr. 87-88, 91-95). He also provided LOTO training for the Department of Defense. (Tr. 93). He performs certificated training classes in electrical safety related work practices, confined space entry, and high voltage applications. (Tr. 88-89. *See* Ex. R-H). Hayes has no college degree or certifications. (Tr. 97). His testimony was received as an expert in LOTO and as experienced in workplace hazard assessment. (Tr. 101).

In connection with this proceeding, Hayes visited Alro's facility three times where he observed both machines. (Tr. 103). He looked at the schematics for the Amada, talked to employees, and observed blade changes on both machines. (Tr. 103-104, 114-16, 125). He testified that he did not look at the manufacturer's documents as the saws were unsophisticated. (Tr. 128, 139, 151-52; Ex. C-19).

Discussing the HEM, he noted that the blades are de-tensioned before removal and that the last step before re-energizing the saw is to put tension on the blade. (Tr. 106-107). Tension on the HEM is reapplied only after the blade is replaced and the doors on the saw cabinet closed. (Tr. 151). If the machine was energized while the blade was de-tensioned, the blade would just sit there and jiggle. (Tr. 107, 169). Hypothetically, if an employee held the blade while de-tensioned there would be no hazard. (Tr. 107). Moreover, when the blade on the HEM is fully tensioned, the employee never has reason to touch the blade. (Tr. 109, 118-19, 142-43). When the operator uses his foot to hold the blade, it is fully de-tensioned. (Tr. 112, 159-60). Hayes testified that the HEM was never partially tensioned. It was either tensioned or un-tensioned.[12] (Tr. 138-39).

Hayes conceded that the HEM manufacturer's written blade change procedures instruct the operator to partially tension "bump the idle wheel downward until most of the slack is removed from the band [saw blade]," while the wheel doors are open. (Tr. 152-57; C-19, p. 40.2-2). This is not the procedure that Hayes observed the HEM operator perform when changing the blade. (Tr. 154). Hayes also stated that when the operator snaps the blade onto the wheels there is a little bit of tension, but not enough to rotate the blade. (Tr. 165).

Hayes opined that if the operator held the partially tensioned blade, when the blade moved, the possibility of injury would be remote, as the employee would wear a heavy duty glove, as personal protective equipment (PPE). (Tr. 141-42). Hayes, however, also agreed that gloves are not an accepted safety device to prevent an amputation hazard. (Tr. 161).

Hayes testified that, in fact, there are six elements on the HEM to keep the blade from moving: the saw blade power-on switch, the emergency e-stop switch, the spring loaded start switch, the PLC (program logic controller) switch, and two interlocks. He stated "[t]o me it's a wild exaggeration to think that all six could fail."[13] (Tr. 146. See Tr. 137). Hayes stated that if the operator pressed the motor stop button and the contactor for the control relay failed to open

[12] In answer to a hypothetical, Hayes conceded that if an operator had one hand on the saw blade and one hand on the tension device, and the blade was partially tensioned, if the band saw is not locked out at the disconnect, and the operator is relying only on interlocks, there is a potential for the blade to start moving at a certain degree of tensioning. (Tr. 144-45, 164). However, during Alro's blade change lockout procedure, the operator is never relying only of interlocks, rather the operator must ensure that, on the control panel, the "start" motor button in off and locked.

[13] As discussed above, Alro's written blade change lockout procedure provided to the CSHO required, on the control panel, only for the motor button to be turned off and locked. The interlocks on the wheel covers also would be used. Alro's procedure makes no mention of the e-stop, spring loaded start switch, or the PLC switch. (Ex. C-17). *See* note 6 above.

the operator would see the saw blade running (either guarded or unguarded) and the next step would be to hit the e-stop (the emergency stop) to find out what happened to the relay electrically. (Tr. 148-49, 150).

Hayes added that the wheel would spin when energized, but would pose no hazard because there is nothing that would catch an employee. In his view, the worst case scenario would be that the wheel could rub against the employee's clothing. (Tr. 109-110). Based on the blade changing procedure he observed, Hayes opined that there was no employee exposure to the moving blade, and no caught-on or amputation hazard. (Tr. 111-12).

Turning to the Amada saw, Hayes testified that employees would not be exposed to a hazard during the blade change after the guard is removed, the machine de-tensioned, and the power shut off. (Tr. 113). He noted that the wheels are de-tensioned before the wheel guard cover is lifted off the carrier wheel. The new blade is placed on the wheel. It is then re-tensioned and the guard replaced. (Tr. 115-116). The tension on the Amada saw is not applied until the guards are back in place. (Tr. 151). Hayes testified that, when de-tensioned, if the saw started unexpectedly, the blade would just jiggle rather than move in a circular fashion as the drive motor attempted to connect to it. (Tr. 116) Hayes did not know how much tension was required to turn the blade. However, he stated that the Amada is never partially tensioned. It is either tensioned or un-tensioned. (Tr. 139-140). He also testified that the spinning wheel would not present a hazard because it has a smooth surface with no projections. (Tr. 116).

In Answer to a hypothetical, Hayes testified that if the motor on the Amanda unexpectedly started, while the blade was being changed and the operator's hand was on the blade, whether that would present a hazard to the employee depended on the blade tension and whether the employee was wearing PPE. (Tr. 149).

Hayes testified that his conclusions were based on the blade change methods he observed the employees use. Employees on other shifts might use a different technique. (Tr. 127-128, 134). As noted above, the HEM blade change procedure described to the CSHO during the inspection differed from the procedure Hayes observed. *See* note 6 above. He further testified that his opinions were not to a scientific certainty, but based on his experience. (Tr. 117).

3. Bryan Curtis

Bryan Curtis is a professional engineer with an electrical engineering background. (Tr. 168, 170, 181). His electrical engineering degree is from the University of Dayton. (Tr. 168).

He is a senior consultant with Matrix Technologies where he reviews electrical schematics and approves projects. (Tr. 170-171). He began working at Matrix in 1993. (Tr. 169). At Matrix, prior to becoming a senior consultant, he worked as a project manager and as a manager of the electrical and instrumentation department. (Tr. 175). He has experience in reviewing control circuits and relays. (Tr. 177, 185). However, before the current project for Alro, he had never reviewed band saw schematics, including for the Amanda and HEM saws. (Tr. 176, 184-85, 212-13). His expert testimony was received based on his experience as an electrical engineer. (Tr. 182). He was not offered as an expert in the LOTO standard or safety. (Tr. 180-81).

Curtis visited Alro's facility on three or four occasions. (Tr. 184, 218-19). He reviewed the schematics for the band saws, the manufacturers' manual for each machine, and thoroughly reviewed the control panels, inside and outside. (Tr. 184, 220). He observed the operators change the saw blade on each machine. (Tr. 219, 221). Curtis opined that, based on the electrical design of each machine, they would not energize unexpectedly during a blade change when the motors are de-energized and locked out at the control panel. (Tr. 185, 208, 220, 222, 257, 265-66). He also opined that, based on the electrical design of the machines, unexpected energization would not occur, even if the control circuit components failed. (Tr. 192-194, 208, 261, 265-66). According to Curtis, his conclusions were to a reasonable degree of engineering certainty. (Tr. 209).

Starting with the HEM, Curtis explained that the switch labeled "motor," that is turned off and locked by the employee during a blade change, has multiple contacts. (Tr. 189, 200-01; Exs. R-B1, R-B3). When the motor switch is turned off it opens contacts in several places. These circuits directly control the contactors that operate the band saw motor. (Ex. R-B1, lines 12, 13 and 14).

The starter for the band saw motor on the HEM has three phases. All three phases must close before the motor will start. (Tr. 189-90, 195). When these contacts close, power flows into the band saw starter coil. (Tr. 190, Ex. R-B1, line 29). Curtis described a control relay contact that is the starter for the band saw motor (CR8). (Tr. 190, 192, 255). Only a signal from that control relay contact (CR8) will result in the contacts for the band saw motor starter to close and the motor to start. (Tr. 190, 192; Ex. R-B1, lines 12, 13 and 14). Curtis described another control relay contact (CR2). (Tr. 191, Exs. R-A11, R-B1). Curtis testified that two things in the circuit will de-energize the control relay contact that turns on the starter for the band saw motor

(CR8): the motor switch and any action taken to energize the control relay contact labeled CR2. (Tr.191-92; Ex. R-B1).

Curtis based his conclusion on his reading of the schematics (Tr. 188, Ex. R-B1-R-B3), his inspection of the control cabinet (Tr. 197-99; Ex. R-A11), the manufacturer's motor spec sheet (Tr. 200; Exs. R-B1, R-C), and the procedure Alro used to lockout the machines.[14] Curtis concluded that there can be no unexpected energization of the band saw motor when the HEM is de-energized at the control panel. (Tr. 185, 192, 219). There are protections and safeguards built into the system that prevent any likelihood of the motor starting inadvertently. (Tr. 196-201). He testified that, if the motor switch button physically fell apart while the circuit was open, the circuit would remain open and would not energize the control relay contact that turns on the starter for the band saw motor (CR8).

On the other hand, the manufacturer's designed control relay signal (CR2) would stop the band saw motor from running when the start / stop button is pushed. If the control relay contact (CR2) failed and never opened, the band saw would remain energized and continue to run. (Tr. 194). With the band saw running, the operator would have notice and would never begin to change the blade. (Tr. 194-95). A failure would not result in an off motor suddenly starting. (Tr. 194). Indeed, it was Curtis' opinion that once the motor switch is locked in the open position, nothing less than a deliberate, malicious act could cause the control relay contact that turns on the starter for the band saw motor (CR8) to energize and the motor to unexpectedly start. (Tr. 192, 261).

Curtis disagreed with the Secretary's expert Washam on whether metal shavings or moisture could bridge the gap between the contacts, complete the circuit, and cause the motor to start. Curtis explained that the HEM band saw motor has a three phase starter. All three phases have to close for the motor to start. (Tr. 190, 195-96; Ex. R-B1, lines 12, 13 and 14). A three phase motor is not capable of starting with just one or two contacts closing. Therefore, to start the motor, the shavings or water would have to make contact across and bridge the gaps in the correct order. To bridge the gaps in each of the three phases in order to start the motor, the water or metal shavings would have to align perfectly, at the same time, with each phase, without touching anything else. Curtis testified that this would not happen. (Tr. 195-196).

[14] As set forth in note 6 above, the HEM band saw blade change Curtis observed differed from the procedures described to the CSHO. (Tr. 187-88, 219). Of importance, however, the blade change procedure Curtis observed involved the machine being de-energized at the control panel, not at the main electrical disconnect.

If water was building up in the control cabinet, from the bottom up, it would have to be chest high by the time it reached the control relay contact (CR2) and the control relay contact that turns on the starter for the band saw motor (CR8). (Tr. 197). The control panel is mounted five feet off the floor. (Tr. 199, Ex. R-A12). The motor is sitting in a box about two feet off the floor. Also, the wiring is protected by fusing to protect against short circuits. In his opinion, even in a shop where there were shavings everywhere and the box was unenclosed, there was no likelihood of water and metal shavings being aligned, at the same time, to bridge the gap in all three phases in order to start the motor. (Tr. 197).

Curtis inspected the box and found no evidence of either metal shavings or moisture. (Tr. 197). He noted that the HEM machine control panel was one of the cleanest 20 year old panels he had seen. (Tr. 199, 213). He noted that the HEM had replaced electrical components, including a relay.[15] (Tr. 233-242; Ex. C-20, C-21). He observed that opening the back of the control panel, to view the control cabinet interior, required breaking one of the interlocks that turned off power to the unit. (Tr. 199, 261; Ex. R-A11). Curtis explained that this interlock was a manufacturer's safeguard to prevent somebody from going into the control panel interior during a blade change. (Tr. 199, 261).

On cross-examination, Curtis agreed that electrical components, including start buttons, selector switches, contacts on interlocks, relays, and starters, have a life expectancy and will eventually fail. (Tr. 244-245, 248). These electro-mechanical devices will fail after a certain number of cycles due to mechanical breakdown or wear and tear. He testified that the band saws are designed that if the switch doesn't work, the machine will not operate. If the start button fails, the switch will be open, and the saw will not operate. If the interlocks fail, they normally will fail in an open state. Curtis testified that electro-mechanical devices usually fail in the open position. Hypothetically, he agreed that a circuit could fail closed. Curtis testified that the HEM was designed in a "fail safe mode," so that if the switch does not work, the machine will not start. (Tr. 244-52, 260, 261-62).

Curtis also reviewed the Amada band saw schematics. (Tr. 201-04, Ex. R-E). According to Curtis, there are many similarities between the structure of the Amada and the HEM. For

[15] Band saw manufacturers recommend a replacement cycle on control circuit components. (Tr. 243, 260). Curtis did not know what control circuit components were included and checked on Alro's maintenance program. (Tr. 251-52).

example, each have motor starters with incoming power from the top and two motors. (Tr. 204). The schematics show a blade drive motor and hydraulic pump drive motor. (Tr. 204). He explained that, when the selector switch is in the off position, the control circuits drop out and the power is off. (Tr. 204). When turned on, the hydraulics, powered separately from the saw motor, come on first.[16] (Tr. 205). To initiate the saw motor, the operator presses the blade drive button (PB2). (Tr. 205-06, Exs. R-E, line 8, R-D5). This completes the circuit and energizes the relay (R1). When the relay (R1) closes, it sends a signal to the motor starter, which is marked on the schematic as "blade on." (Tr. 204-207, Ex. R-E, marked X3). This closes the contactor for the motor starter on the blade drive motor. (Tr. 206). If the relay (R1) does not close, there is no energization, and the band saw motor will not start. (Tr. 207).

The Amanda is a three phase motor. The phases are physically separated by an air gap. (Tr. 206, 254). If the contact is open, the air gap is a sufficient distance so energy will not pass from one side to the other. (Tr. 206-07). If the contact is closed, there is a path for the energy to flow through the contacts and the motor will run. (Tr. 207). Curtis explained that the "blade on" motor starter must be energized for the contact to close. It would not close by itself unless someone performs a malicious act. (Tr. 207).

Curtis further testified that no failure in any of the control circuitry would result in an unexpected energization of the Amada during the blade change procedure. (Tr. 208). The only way to bypass the "blade drive" motor button is to open and physically go into the control cabinet to either mechanically or electrically get around the switch and defeat it. (Tr. 208, 261). Based on his examination, it was his opinion that, with the button locked out, with no access to the inside of the cabinet, and with no access to the starter, there is no other means for electricity to complete the circuit. (Tr. 208). Consistent with his testimony regarding the HEM, he stated that water or metal chips would not cause an unexpected motor startup. The control panel is five feet off the floor, before room water was that deep the circuit breaker would trip. (Tr. 208-09). There are built in design safeguards in the electrical circuit to prevent grounding problems and short circuits. (Tr. 209).

Curtis testified that the applicable ANSI standard, ANSI B 11.10-2003 (R09), Safety Requirements for Metal Sawing Machines, states that the unexpected startup of band saws due to failure of the control system can happen. Curtis did not see that happening regarding the saws at

[16] Hydraulics on the Amanda are used to hold vices and parts, not for tensioning. (Tr. 205).

issue in this case as their control systems are hard wired. He noted that the ANSI standard is designed to apply to all band saws, including those operated with computer controls. While he opined that computer controls may fail, the HEM is semi-automatic and the Amada is purely rely only control and has no computer. (Tr. 221, 257-59). Curtis stated that, even though the HEM had a computer, the circuit was designed so that the computer could not override the hard wired, open circuit. (Tr. 263-64. See Tr. 223). The ANSI standard also mentions monitoring requirements. Curtis testified that the HEM has lights and alarms as part of the circuitry. (Tr. 263).

Positions of the Parties

Secretary's Position

The Secretary asserts that the cited LOTO standards apply to the blade changing activities performed by Alro's band saw operators. The LOTO standard applies to the service and maintenance of machines and equipment in which the unexpected energization or startup of the machines or equipment, or release of stored energy, could harm employees. 29 C.F.R. §1910.147(a)(1)(i). There is no dispute that Alro's blade changing activities constitute service and maintenance.

The Secretary states that Alro's procedure for changing the band saw blades involves many of the necessary LOTO requirements, but not all. The Secretary contends that Alro's blade changing procedure is violative of the LOTO standard as Alro's procedure does not isolate the machines from all of the energy sources. 29 CFR §1910.147(c)(1). Reliance on control circuitry, such as a start button, merely interrupts the flow of power, allowing the machine to remain energized. (Tr. 41). It does not isolate the machine from the energy source and, therefore, is an inadequate method of locking out a machine. (Sec'y Br. pp. 1, 5, 7).

Alro's expert witness Curtis opined that the band saws could not unexpectedly energize following Alro's blade changing procedure. The Secretary contends Curtis' opinion is flawed. Curtis' testimony reveals that Alro's blade changing procedure relies on control circuitry, relays, interlocks, and push buttons to prevent the unexpected energization of the band saws. The Secretary notes that, during his testimony, Alro's expert Curtis admitted that the mechanical components of the control circuit can fail. (Sec'y Br. pp. 5-6).

The Secretary points out that push buttons, such as those used by Alro, are specifically excluded from the definition of an "energy isolating device" in the LOTO standard.[17] The standard specifically states that "push buttons, selector switches and other control circuit type devices are not energy isolating devices." 29 CFR §1910.147(b) (Sec'y Br. p. 6). The Secretary asserts that the reason control circuit devices, such as start buttons, are insufficient is that they have a limited lifespan and can fail, resulting in the unexpected startup of the machine. (Tr. 41-42; Sec'y Br. pp. 5 - 7, 10).

The Secretary states that the Commission has held that "unexpected energization" is the "absence of some mechanism to provide adequate advance notice of machine activation" to the exposed employee. (Sec'y Reply Br. p. 2, citing *Gen. Motors Corp., (GM)*, 22 BNA OSHC 1019, 1023 (No. 91-2843E, 2007)(consolidated)). The Secretary contends that Arlo's Amanda and HEM band saws were not designed and constructed to give service and maintenance employees notice of what is about to happen. The Secretary argues that Arlo presented no evidence of any warning system, start up bells or whistle, or elaborate restart process, that would notify the band saw operator that the machine was going to start. If the control circuit fails during a blade change, the band saw operator will not know until it is too late. The Secretary contends that "Arlo's argument that the Secretary has the burden of proof to show unexpected energization by virtue of control circuitry malfunction" is unsupported. (Sec'y Br. p. 8; Sec'y Reply Br. pp. 1-2).

The Secretary asserts that operators of both machines had their hands at the point of danger, on or near the saw blades. During the HEM band saw blade change the operator also had his foot at the point of danger, on or near the saw blade. (Tr. 57). An unexpected startup of the machine could result in an amputation or severe lacerations. (Tr. 45) (Sec'y Br. p. 8).

The Secretary found Respondent's written LOTO procedure, used for other service and maintenance activities on the Amanda and HEM band saws, to be compliant with the LOTO standard.

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[17] An "energy isolating device" is defined at 29 CFR §1910.147(b) as:

> A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. *Push buttons, selector switches and other control circuit type devices are not energy isolating devices.* (emphasis added).

Respondent's Position

Respondent states that Alro's LOTO policy for blade changes provided for the band saws to be de-energized and locked out at the control panel. Relying on the Commission's decision in *Gen. Motors Corp., Delco Chassis Div., ("GM-Delco"),* 17 BNA OSHC 1217, 1219 (No. 91-2973, 1995)(consolidated), *aff'd*, 89 F.3d 313 (6th Cir. 1996), Respondent asserts that the LOTO standard does not apply where "unexpected energization" cannot occur. Respondent asserts that it is the Secretary's burden to show that "unexpected energization" can occur. Respondent argues that the Secretary failed to meet his burden as no evidence was presented that the band saws could unexpectedly energize when they are de-energized and locked out at the control panel. Respondent contends that the CSHO did not testify that either the HEM or the Amada saws could start unexpectedly. Rather, he testified that the standard was violated because Respondent relied on control circuitry, and did not de-energize the saws by isolating them from the main energy source. Respondent further contends that the Secretary failed to show evidence of a hazard to employees, even if the band saws were to unexpectedly startup during Alro's blade change procedure. (Tr. 12; Resp. Br. pp. 1-2, 9-10, 15, 24-26, 28-30; Resp. Reply Br. pp. 5-6.)

Respondent contends that the testimony of the Secretary's expert Washam was similar to the CSHO's, that there was a violation simply because Respondent relied on control circuitry, rather than locking out the saws at the main disconnect. Respondent emphasizes that Washam is not an electrical engineer, did not consider the schematics of the machines, and never looked at or inspected the machines.[18] (Tr. 278-279). Washam's testimony regarding control circuitry was not based on the design and operation of the band saws at issue. Washam's testimony consisted of anecdotal occurrences on machines other than the band saws at issue in this case. (Resp. Br. pp. 3, 15-18, 20-21, 24).

In contrast, Respondent called two expert witnesses. Curtis, P.E., an electrical engineer, who inspected the band saws and studied the schematics of both machines. He opined that the band saws were not subject to unexpected energization during a blade change when the saw motor is de-energized and locked out at the control panel. Curtis testified that the electrical design of the machines provided that even if the control circuit components failed, that failure would not result in unexpected energization. Respondent's expert Hayes inspected both

[18] Washam did not rely on the operator's manual for either band saw when drafting his written expert report. (Tr. 279-80).

machines, observed blade changes on both machines, and spoke with the operators. Hayes testified that, if the machine did start unexpectedly during the blade changing procedure, the operator would not be exposed to any hazard. (Resp. Br. pp. 1-3, 15-25, 27-29; Resp. Reply Br. pp. 1, 3-6).

Scope and Application of the LOTO Standard

To establish a violation of the cited OSHA standard, the Secretary must establish by the preponderance of the evidence that: (1) the standard applies to the facts; (2) the employer failed to comply with the terms of that standard; (3) employees had access to the hazard covered by the standard, and (4) the employer had actual or constructive knowledge of the violation (i.e. the employer knew, or with the exercise of reasonable diligence could have known, of the violative condition). *Atl. Battery Co.,* 16 BNA OSHC 2131, 2138 (No. 90-1747, 1994).

Accordingly, in the instant case, the Secretary first must establish the applicability of the LOTO standard to the work activity performed on the Amanda and HEM band saws. The Secretary must show that the blade changing activity cited is a service or maintenance activity during which the *unexpected* energization or startup of the machines or equipment, or release of stored energy, could cause injury to employees. 29 CFR § 1910.147(a)(1)(i)(scope) (emphasis in original). *See Gen. Motors Corp., Delco Chassis Div., (GM-Delco)*, 17 BNA OSHC 1217, 1217-18 (No. 91-2973, 1995) *aff'd,* 89 F.3d 313, 315 (6th Cir. 1996).

The phrase "*unexpected* energization" is not defined in the standard. Notably, that phrase "*unexpected* energization" is repeated and emphasized several times in the LOTO standard. *See* 29 CFR §§ 1910.147(a)(1)(i)[19], (b)[20], and (c)(1)[21]. *See GM-Delco*, 17 BNA OSHC at 1218. The

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[19] The scope of the general industry LOTO standard:

> covers the servicing and maintenance of machines and equipment in which the *unexpected* energization or start up of the machines or equipment, or release of stored energy, could harm employees. This standard establishes minimum performance requirements for the control of such hazardous energy.

29 CFR § 1910.147(a)(1)(i)(scope)(emphasis in original).

[20] The LOTO standard defines "service and maintenance" as:

> [w]orkplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the *unexpected* energization or startup of the equipment or release of hazardous energy.

29 CFR § 1910.147(b)(definitions applicable to this section)(emphasis in original).

[21] The LOTO energy control program states:

Commission has noted that the term "unexpected" is a "limitation on the application of the standard." *See GM-Delco*, 17 BNA OSHC at 1220. Absent a mechanism to provide adequate notice to employees of machine activation, the Commission has held "energization" to be "unexpected." *Dayton Tire, Bridgestone / Firestone*, 23 BNA OSHC 1247, 1250 (No. 94-1374, 2010), *aff'd in relevant part*, 671 F.3d 1249 (D.C. Cir. 2012), *citing Gen. Motors Corp., (GM)*, 22 BNA OSHC 1019, 1023 (No. 91-2843E, 2007)(consolidated); *Burkes Mech., Inc.,* 21 BNA OSHC 2136, 2139 n.4 (No. 04-0475, 2007).

> The standard is meant to apply where a service employee is endangered by a machine that can start up without the employee's foreknowledge. In the context of the regulation, use of the word "unexpected" connotes an element of surprise, that there can be no surprise when a machine is designed and constructed so that it cannot start up without giving a servicing employee notice of what is about to happen.

Burkes Mech., 21 BNA OSHC at 2139 n.4, *quoting Reich v. Gen. Motors Corp*., 89 F.3d 313, 315 (6th Cir. 1996). *See Dayton Tire*, 23 BNA OSHC at 1251.

Determining if the "*unexpected* energization" or startup of machines or equipment can occur, the Commission also has considered whether possible electrical failure can cause inadvertent activation. *See GM-Delco*, 17 BNA OSHC at 1221 (possible electrical failure did not present an inadvertent activation hazard as the machinery in GM's system would shut down, not startup, in the event of a short circuit or ground).

The Commission has held that it is the Secretary's burden to show that the "'particular machine could energize, start up, or release stored energy without sufficient advance warning to the employee.'" *Dayton Tire,* 23 BNA OSHC at 1251, quoting *GM-Delco*, 17 BNA OSHC at 1219-20.

To prove a violation, the Secretary also must establish that employees had access to the hazard covered by the LOTO standard. The Commission has held that access to the hazard is established "where the evidence shows it is reasonably predictable that an employee engaged in

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> The employer shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment *where the unexpected energizing, startup or release of stored energy could occur and cause injury*, the machine or equipment shall be isolated from the energy source and rendered inoperative.

29 CFR § 1910.147(c)(1)(emphasis added).

servicing or maintenance will be exposed to the hazard of unexpected energization." *GM*, 22 BNA OSHC at 1029-30.

Discussion

In this case, many facts are undisputed. Alro's blade changing procedure for the Amanda and HEM band saws did not include isolation of the machines from the energy source at the main electrical disconnect. The operator, when changing a band saw blade, would turn off the band saw by turning the "start" switch / button to the off position, place a plastic cover over the button located on the machine operating control panel, lock the cover in place with a single key, and retain possession of the cover key during the blade change. As this was Alro's established procedure for blade changes, Respondent's knowledge of the operators' practice during saw blade changes is unquestioned. (Tr. 46, 48, 53, 55). There is no dispute that Alro's blade changing activities on the Amanda and HEM band saws are service and maintenance activities. (Tr. 31, 56). The question presented is whether the Amanda and HEM band saws, during blade changing activities, could unexpectedly energize.

It is the Secretary's position that anytime a machine is not isolated from its energy source, there is a hazard that the machine could incur an unexpected release of energy. Relying on control circuitry allows the machine to remain energized and, therefore, subject to unexpected energization through accident or mechanical failure. Control circuitry is inherently subject to inadvertent startup due to breakdown and failure in the circuit. Only by totally isolating the saws from the power source, will employees be completely safe from the hazard of "unexpected energization." That is why, the Secretary argues, the LOTO standard specifically prohibits employers from relying on control circuitry, such as turning off a "start" motor button, to lockout a machine.

In this matter, the Secretary does not contend that the band saws presented a hazard due to stored energy or the capacity for stored energy. (Tr. 42, 51, 62). The Secretary does not contend that the band saws are subject to accidental or inadvertent startup by the operator or someone other than the operator. (Tr. 41-42, 50-51, 73).

The issue presented is whether the Secretary has established that, despite the startup procedures developed by Alro and the control circuitry upon which it relied, employees servicing the saws during blade changes were exposed to the hazard of "unexpected energization," through equipment malfunction resulting in inadvertent startup. If there is no likelihood of inadvertent

startup, there is no likelihood that employees are exposed to "unexpected energization." Where the hazard of "inadvertent startup" is established, the Secretary must show that employees did not have sufficient warning that the machine was starting to enable the employees to remove themselves from danger. The burden is on the Secretary to show that an unexpected startup of the machine at issue can occur and cause injury. *GM-Delco,* 17 BNA OSHC at 1219-20.

I have considered and weighed the testimony of the Secretary's witnesses, the CSHO and Washam. Both testified to generic hazards generally applicable to all machines. The Secretary did not present any evidence specific to the band saws at issue in this proceeding. The CSHO's concern regarding Alro's blade change lockout procedure was that the machine remained energized and, therefore, the potential remained for the equipment to start unexpectedly. (Tr. 41-47).

I have considered and weighed the testimony of the Secretary's expert. Washam has long experience in LOTO course development, training, audits, and workplace accident investigations. Washam *generally* described potential machine malfunctions regarding control circuits where electrical contacts may close due to water, metal chips, and deterioration at the end of a machine component's design life. His testimony was generic, not specific to the band saws at issue in this case. Washam did not inspect Respondent's machines or review the schematics for the band saws. He testified that he saw no need to do so. (Tr. 278-279). Washam's contention that Respondent's machines could start unexpectedly was based on prior incidents that he heard about and personal experiences that had no connection to the band saws at issue other than that they all were machines.

The Secretary called Washam as a rebuttal witness after Respondent produced the expert testimony of Hayes[22] and Curtis. In rebuttal, the Secretary never attempted to adduce from Washam testimony specific to the cited saws. This is understandable since the Secretary's position is divorced from the particulars of the band saws at issue in this case. As Washam's testimony and opinions are not specific to the saws at issue and as Washam's testimony did not specifically rebut Curtis' testimony regarding the safeguards in place to prevent unexpected startup during blade changes on the Amanda and HEM band saws, I find Washam's testimony less helpful and accord it limited weight.

[22] Respondent's expert Hayes was called to rebut the Secretary's assertion that employees would be exposed to injury if the saws started unexpectedly. His testimony was not directly relevant to the primary issue: whether the saws were subject to "unexpected energization." Therefore, I find his testimony to be of limited value.

Alro's expert Curtis concluded that the saws were not subject to "unexpected energization." His conclusion was based on his visits to the Alro facility, inspection of the saws, and review of the schematics. Curtis did not deny that other saws could be subject to unexpected startup, but concluded that this was not the case with the cited saws. As Curtis' testimony is based on his specific review and inspection of the saws at issue in this case, I accord his testimony great weight.

I grant Curtis' opinions substantial weight. That based on the electrical design of each machine, they would not energize unexpectedly during a blade change when the motors are de-energized and locked out at the control panel. That based on the electrical design of the machines, unexpected energization would not occur, even if the control circuit components failed. That if there was an equipment malfunction regarding the electrical contacts, the contacts would fail in the open position and, therefore, the failure would not result in the saw unexpectedly energizing. Further, that in the unlikely event that the electrical contacts were to fail in the closed position, the band saws would continue to run, providing obvious advance notice to the operator not to begin a blade change.

Curtis is a licensed professional engineer, with a degree and long experience in electrical engineering. He has substantial experience reviewing schematics and circuit controls. (Tr. 168-171, 177). He has experience applying the LOTO standards when working on a system or project. (Tr. 179). Although prior to this current Alro project, he had no specific experience regarding either the Amada or HEM saws, his wide experience as an electrical engineer was very helpful as it related to the principles that control the electrical systems of the saws at issue. As stated above, I find Curtis' testimony convincing and I grant it substantial weight.

Considering and weighting all of the evidence, I find that the Secretary failed to establish that on the Amanda and HEM band saws, during blade changing activities, the saws were subject to unexpected energization. Accordingly, based on the record in this case, I find that the LOTO standard is not applicable to the cited activity, Alro's blade changing procedure on the Amanda and HEM band saws.

In his reply brief, the Secretary asserts that the citations in *GM-Delco*[23] were vacated because the subject machines had various mechanisms, such as bells and whistles, that would warn employees that the machines were about to start. It was these warnings, the Secretary

[23] 17 BNA OSHC 1217 (No. 91-2973, 1995).

asserts, that led the Commission to decide that any energization would not be "unexpected." In the instant case, the Secretary argues, there were no mechanisms to warn employees that the machines were about to start. Therefore, employees were exposed to the hazard of "unexpected energization."

The Secretary argues that subsequent cases turned on whether the machines at issue had a mechanism to warn employees before the machines began operating. *e.g. Dayton Tire,* 23 BNA OSHC 1247; *GM,* 22 BNA OSHC 1019; *Burkes Mech.,* 21 BNA OSHC 2136. The Secretary reads the cited cases too narrowly. A thorough reading of these cases establishes that a machine is subject to "unexpected energization" where employees are endangered by a machine that can accidentally or inadvertently become energized and there is no warning mechanism to alert employees that the machine is about to start. For example, in *Burkes Mechanical* finding the machines to be subject to "unexpected energization," the Commission distinguished that case from *GM-Delco* stating that

> [u]nlike [the deactivated] machines [in *GM-Delco*], the fuel wood conveyor [in Burkes] was neither deactivated nor *'designed and constructed' to eliminate unexpected energization.* Rather, without providing notice to nearby workers, the running conveyor could have been stopped and restarted by simply pressing a button….

21 BNA OSHC at 2139 n.4 (emphasis added). *See also GM*, 22 BNA OSHC at 1030 n.13 ("Where, as here, the evidence shows switches and buttons used to operate energized equipment undergoing servicing and maintenance could be accessed by any passerby to reactivate a shutdown machine, the Secretary has established that the energization of such equipment would be unexpected.")

In *Dayton Tire* the Commission stated:

> even if we were to accept Dayton's argument that the phrase "*unexpected* energization" is vague as used in the LOTO standard, a reasonable employer could determine whether its machines are subject to unexpected energization. Indeed, such an employer could make this determination based on facts within its knowledge, *including the circumstances under which machines could become energized and, after energization,* the length and quality of any warning prior to movement or start up of the equipment.

23 BNA OSHC at 1251 (emphasis added).

Finally, *GM-Delco* involved many different machines. One of those machines had a warning mechanism. Other machines had no such mechanism. Rather, they had multiple steps

that had to be performed in close proximity to the employee performing the servicing who, therefore, would be aware that the machine was being started. That, the Commission found, was enough to show that the machines were not subject to "unexpected energization." Indeed, the Commission observed that:

> the Secretary seeks to disallow reliance on even the most failsafe control circuit devices—even where the employees as well as employers favor them. We find that this unreasonable approach is flatly inconsistent with the unambiguous terms of the standard, as well as the preamble and the Secretary's other contemporaneous explanations of the standard.

GM-Delco, 17 BNA OSHC at 1220. As noted above, the Commission further considered whether an electrical failure could present an inadvertent activation hazard regarding the cited machines and determined that credible, persuasive, testimony established that no such hazard existed. 17 BNA OSHC at 1221.

Finally, in his reply brief the Secretary points out that Respondent has compliant LOTO procedures for the service and maintenance of both saws. (Exs. C-15, C-16). The Secretary argues that Respondent's development of these procedures demonstrates that the saws were subject to unexpected energization. At first blush, the Secretary's argument posits an interesting premise. However, close examination reveals the flaws in the theory. There is nothing in the record to suggest the nature of the service and maintenance procedures that would require the use of Respondent's compliant LOTO procedures. For example, unlike blade changes, routine service and maintenance might require that the start buttons remain accessible, making it impossible to lock them out.[24] This would create a real possibility that the start button could be pushed accidentally and "unexpectedly energize" the saw. The Secretary's query raises a question, but provides no answer. The burden is on the Secretary to establish that the saws were subject to "unexpected energization." Failing to adduce evidence relevant to this contention, it must fail.

The preponderance of the evidence demonstrates that neither of Respondent's saws was subject to inadvertent startup and unexpected energization. Moreover, the evidence establishes that, for the saws to start, the operator is required to engage in a multi-step process, which includes reaching into his pocket for a key and unlocking the start button. Based on this record, I

[24] Indeed, it is likely that, in many instances, servicing and maintenance requires that work be performed on the control panel, which would leave the start button exposed.

find that the Secretary failed to establish that either the Amada or HEM saws were subject to "unexpected energization" during Alro's blade changing activity. Accordingly, I find that the LOTO standard is not applicable to the cited bland changing activity on the band saws.

Findings of Fact and Conclusions of Law

The foregoing decision constitutes the findings of fact and conclusions of law in accordance with Rule 52(a) of the Federal Rules of Civil Procedure.

` *Conclusion and Order*

Based upon the foregoing decision, it is ORDERED that:

Citation 1, item 1, in its entirety, is VACATED.

/s/ Carol A. Baumerich

Carol A. Baumerich
Judge, OSHRC

Dated: September 25, 2015
Washington, D.C.