

3 Presenters, Discussion after
John Stearns: Amity High School- Amity,OR
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Classroom Safety- John Stearns

1. Keep Safety Simple
 - a. Remember you are dealing with Freshman.
 - b. Make easy references, keep things consistent through all tools
 - i. Rule of 3
 - ii. Rule of 12
 - c. Post reminders all over the shop
 - d. Teach safer tools first and work up to more dangerous
 1. Reference tools you are going to teach later.
2. Teach Safety through projects
 1. It will help students remember
3. Keep Safety Records
 1. Save all Safety Tests- 4 years
 2. Consider Cameras
 1. Costco has an 8 camera HD set up for \$400
4. Expect the best. Do not compromise on Safety.
 1. 100% on Safety Tests
 2. Retake the test if a mistake is made
 3. When you are using tools, make sure you are following your own safety rules. Both in front of your students and on your own.

5. Accidents do not happen, Accidents are caused.

1. There is always an underlying reason for injury.
2. Be certain that your students understand their role in preventing injury not only to themselves but their classmates too.

6. Keep machines in good working order, and tooling sharp

a. It is your responsibility to make sure your tools work like they should and your tooling is sharp and in good working order.

b. Guards and guides are in good proper working condition.

Tooling Safety - Lucas Molepske
Tooling safety

Router Tooling

1. Using the right tool for the job
 - Downcuts don't drill, not for use in inverted router table, or hand router
 - Upcuts can lift parts, cause them to move
 - Proper tightening of collets
 - Enough tool in the collet
2. Insert/c.t. tooling
 - Balance
 - Surface footage
 - Proper tightening of inserts

Sawing

1. Hook angle, table saw vs. chop saw
2. Grind for different materials
3. Number of teeth

Sharp tooling is key

1. What causes a tool?
 - Heat
 - Abrasive material
 - Chemical wear
2. Signs of dull tooling
 - Amp load increase
 - Spindle temp increase
 - Noise
 - Visual chipping
 - Burning or build-up

A Fresh Look At Machine Safeguarding

John F. (Jack) Podojil

- The topic of machinery safety is not a new subject.
- Fact: Most machines (approximately 85%) located in Technical Education are unsafe.
- Fact: Many High Schools do not have a formal safety & health program for technical education classroom.

A Fresh Look At Machine Safeguarding

- Fact: A technology education instructor has an essential task to provide students with the proper safety policies and procedures for working with a variety of equipment and materials used in their laboratories.
- Fact: Technology education instructors have the responsibility and are legally liable for not educating the students in the equipment's owners/ operators manuals prior to allowing a student to operate a machine
- Fact: Currently, the Department of Instruction in many areas in the United States does not provide teachers with an easily accessible comprehensive safety guide.
- The potential lack of consistent safety policies and procedures create liability issues for both the school district and the instructor.
- Safety instruction is a critical component in any technology education curriculum.
- Learning to use proper safety procedures not only impacts safety in the classroom but the work place as well, since many students seek employment in industry.
- Your responsibility as a teacher You must perform three basic duties to prevent negligence:
 - Proper and complete instruction,
 - Provide vigilant supervision, and
 - Maintaining facilities and equipment at an optimal level of safety.
- Failure to perform these duties could result in a teacher or administrator being liable for damages.

Occupational Safety & Health Act

- A new national policy was established on December 29, 1970, when President Richard Nixon signed into law the OSHAct
- The OSHA Act took effect April 28, 1971 and was called the Williams / Stieger Act

OSHA History

- The Congress of the United States declared the purpose of this piece of legislation was to "Assure so far as possible every working man and woman in the nation, safe and healthful working conditions and to preserve our human resources".

- The employer (The School District) has the General Duty “to furnish each employee with employment and a place of employment free from recognized hazards causing or likely to cause death or serious physical harm”.
- Although OSHA does not enforce their standards against students, they do enforce their standards against the employer because they hire instructors.

An Employer’s Responsibility

- Provide a safe place of employment. (A plan)
- Provide a written safety and health plan to the employees.
- Communicate the plan to employees (Training)
- Enforce the plan.

General Duty Clause

- For employers, the General Duty clause is used by OSHA when there are NO specific standards applicable to a hazard.

ANSI Standards

- American National Standards Institute (ANSI) are standards developed by experts in the industry.
- These standards explain the hazards involved in operating machinery.
- Considered Best Practices.
- ANSI standards explain the hazards involved in operating machinery.
- ANSI standards are enforceable by law under the General Duty Clause.

ANSI Standards For The Safety Professional

- ANSI TR-3 Risk Assessment.
- ANSI B-11.19 Safeguarding machinery as referenced by other ANSI B-11 standards.

Machinery ANSI Standards

- B11.2 Hydraulic presses
- B11.3 Press brakes
- B11.4 Shears
- B11.5 Iron workers
- B11.6 Lathes
- B11.8 Milling & Drilling machines
- B11.9 Grinding machines

- B11.10 Metal sawing machines
- B11.21 Robotic safeguarding
- ANSI 01.1 Woodworking

OSHA Standards

- OSHA standards are vague on many types of machines and often conflict with each other. (example)
- 1910.213 of the woodworking standard states the top portion of a disc sander does not have to be guarded, but the unused portion of a belt sander has to be guarded.
- 29 CFR 1910.212 (a)(1) of the General Machine Guarding standard states “ One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards created by the point of operation, rotating parts etc.”

The Problem

- It is presumed that machine designers strive to produce safe machinery.
- Today, manufacturers still produce unsafe machinery. Example: guards missing, controls inadequate, manuals that do not properly address the hazards, etc.
- This equipment usually sells for \$500.00 or less. Example: Drill presses, saws, sanders, grinders, etc.
- Manufacturers are not under OSHA jurisdiction unless their employees are exposed to the hazard.
- Would you like to buy machinery that is unsafe and expose your students to the hazards just mentioned?
- Would you let your family, students or children run the equipment if you were aware it was unsafe?

The Letter Of The Law

- You as a teacher are under OSHA regulations and the school district must provide you with safe machinery. SEC. 5. Duties
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

Faulty Machine Design

- An effective machine guarding program must begin with a thorough analysis of the potential hazards found on all machinery located in a facility.
- Guarding missing.
- Inadequate strength of the guarding device.
- Improper color-coding of hazards.
- Emergency stops missing or not properly located.

Good Example Machinery Guarding From the Manufacturers

- Properly guarded drill presses.

Risk Control

- Risk Control: This strategy is also known as “Loss Prevention” and can involve a series of different steps that, if followed properly, will act to minimize or manage the risks of injury.
- Examples of this strategy as it relates to a Tech Studies program include, but are not limited to the following:
 - Define general shop safety rules for all students to follow during Tech Shop classes – have each student sign a Shop Safety Agreement whereby they acknowledge they are aware of these rules and that they will follow them.
 - Review periodically.
 - Define safety rules for each piece of equipment – e.g. use of safety goggles, push sticks, machine guards in place at all times, use of proper safety gloves/equipment etc.
 - Provide training for users about safety rules.
 - Document student attendance to ensure all students were present for these lessons.
 - Review safety rules periodically.
 - Test users and document results – issue “certificates” to validate satisfactory completion of safety training for each piece of equipment.
 - Remember under the law, if you did not cover the information that is found in the machines owners / operators manual with the student prior to allowing them to operate the machine, then they were not properly trained and you can be held liable for their injury.
 - As the instructor, you must demonstrate correct techniques on how to use each machine – document student attendance to ensure no student has missed this aspect of the training.
 - Supervise students carefully at all times. Never allow a student to operate a machine unless you are present in the classroom where the machines are being operated.
 - Difficult or unusual cuts or procedures should be performed by a skilled instructor.
 - Post safety signage and safety instructions on all of the machines.
 - Install emergency “STOP” buttons on all machines
 - Since the preceding risk identification process identified table saws and jointer/planers as high risk, applying this strategy to table saws and jointer/planers in wood shop, risk avoidance may take the form of having the instructor perform difficult cuts, or having students use alternative methods or tools that avoid the need to use this dangerous equipment.

Lockout, Tagout & Tryout

- Too many times we speak of Lock-out & Tagout (LOTO) and miss the most important feature the

Tryout phase.

- OSHA 1910.147 standard still ranks high on OSHA's hit list.

A True Accident Revisited.

- Two workers seriously injured when they failed to tryout an electrical system that was miss-marked. As the workers were preparing to remove a breaker they locked out the electrical system at the main. The circuit was changed earlier and the panel was never remarked by the contractor. Employees were trained in (LOTO) but never took the final step to ensure that the energy was dissipated. Employees used a metal ratchet to take the breaker out and the ratchet arched across 220 / 480 volts causing an explosion. Employees suffered severe & critical electrical burns and will never return back to work.
- How do I know about this accident? I was the one who investigated it and to further clarify this issue, I was the safety professional who identified the original Unsafe condition and management never corrected the unsafe condition and two people will never work again.
- When you return back to your classrooms, review your programs with your students and cover the information in the machines owners / operators manuals.
- Ensure, by conducting the annual audit, that everyone is educated in the proper lockout / tagout and tryout procedures.

Finally

- Remember my words, the machine is either safe or it is unsafe.
- "The greatest gift that you can give to another is knowledge, for knowledge is power—power to build and to dream. What you can envision in your mind, you can achieve." ~ Jack Podojil