Instructor's Notes Sawmill Safety Module 4 –

Kiln Safety

Timber Products Safety

- There is a high incidence of serious and fatal injuries in our industry.
- The Timber Products Manufacturers Association along with your employer recognizes the need for improved safety training for the industry.
- With a grant from OSHA, TPMA has developed the following training module to contribute toward the need for improved safety training and hazard recognition skills for those employed in America's timber industry.

This Training Module

- Uses adult learning techniques
- Contains photos and video of actual practices in the timber products industry
- Has interviews with experienced timber industry workers
- Includes a short interactive exercise
- Provides new techniques for recognizing hazards

Training Module Worksheet

Hand out the worksheet and pens

- Since adults learn the most by doing, a worksheet has been prepared to help you retain the most important information.
- You will complete the worksheet as we move through the material. This means that you will fill in the blanks or complete lists.
- A completed worksheet contains most of the key points presented in this module. You will need the worksheet to complete the interactive exercise.
- You may keep the worksheet as a reference.

Safety

(Whenever you see the words highlighted in red and black like these words, it means it is time to fill in the worksheet)

Let's get started with a functional definition of safety. It is called a functional definition because it is easy to remember; it is fundamental to incident prevention and it is something that you can use to improve your hazard recognition skills.

"Safety is a process for reducing risk and **preventing incidents** by effectively managing the **movement** of **people, equipment, material and energy"**. There are some key words in this definition. The first one is **movement**. No injury or incident

has ever occurred without some form of movement. The other key words are **people, equipment, material and energy.** They are key because they are the only four things that can move. Think about it, if we were able to effectively control the movement of people, equipment, material and energy in our process, we would have no injuries or incidents. It is when we don't have control over the movement of people, equipment, material and energy that injuries and incidents occur.

Hazard.

A hazard may be defined as – **any source of danger**. There are two major types of hazard. The first type is an **unsafe condition**. The second type is an **unsafe behavior**.

It should be pointed out that the term behavior is used in the scientific sense. That is, in science behavior is defined as an observable action. Therefore, by itself behavior is neither good nor bad – it is merely an observable action. On the other hand, an unsafe behavior, by definition, is an observable action that is a source of danger.

Here are several examples of <u>unsafe conditions</u>:

- Open kiln door not secured in a windy environment
- Unguarded steam condensate pond
- Unstable stack of lumber

Very often there is a direct relationship between unsafe conditions and unsafe behaviors. For Instance-

While an open and unsecured kiln door in a windy environment is an unsafe condition - Failing to use the securing mechanism for the kiln door after opening it is an unsafe behavior.

While an unguarded steam condensate pond is an unsafe condition – Knowingly draining steam condensate into an unguarded pond is an unsafe behavior.

While an unstable stack of lumber is an unsafe condition – Stacking lumber on an unstable base is an unsafe behavior.

Incident

An incident is an **unplanned event** that happens after an **unsafe behavior or unsafe condition** or both. Incidents interrupt the normal progress of an activity and may result in injury or damage. So you can see three bad things can happen when incidents occur. Someone may be injured, equipment may be damaged or the process may be interrupted. All three are unnecessary, expensive and in one way or another painful.

The most important thing to remember is that before every incident there is an unsafe behavior or unsafe condition or a combination of the two. So, if you wanted to be proactive and prevent incidents, What would you do? I think we can all agree that we would focus on the elimination of unsafe behaviors and

unsafe conditions because they always happen before an incident.

A Sequence That Leads to Incidents

The sequence always begins when there are hazards in the work place. Either unsafe conditions or unsafe behaviors or a combination of unsafe conditions and behaviors must be allowed to occur and remain uncontrolled. If this happens, sooner or later there will be an event involving the movement of people, equipment, material or energy that will lead an incident.

All incidents result from an event that was generated by hazards. Events will happen whenever hazards are allowed to exist. This is why hazard control or hazard elimination is so important.

What is the Best Way to Prevent Incidents?

First of all **recognize** the hazards. Once hazards are recognized there is an opportunity to **manage the movement** of people, equipment, material and energy. The objective is to separate people from the hazards in an organized and controlled manner.

Manage the Movement

Remember that **all** incidents begin with **movement**. Either the **person moves** to the hazard or the **hazard moves** to the person in an uncontrolled or disorganized environment.

#1 Potential for Serious Injury

The number one potential for serious injury in terms of severity involving kiln operation is being **struck by something.** And that is a fact! **About 40%** of all serious injuries during the drying process involve a worker being struck by something.

No. 1 Hazard – Falling Boards

Play and discuss

Event Classification - Struck *By*

The American National standard for Information Management for Occupational Safety and Health provides a classification structure for 46 different events and exposures. We are going to take a look at 3 of those events and exposures that occur most frequently at sawmills during kiln operation. Remember the key words in the definition of safety – the key word **movement** is demonstrated well in all three event classifications that we will discuss.

What is the movement in a struck by incident. The answer is pretty obvious; something moves to strike a person. The weight and speed of the object that strikes a person along with the part of the body involved in the impact will determine the extent of injury.

What do you see?

The hopper is overfilled. Everything above the rim of the hopper has the potential to fall out and strike something or someone. When are the board scraps most likely to fall out? When the hopper is moved is the most likely time. I think there is even potential for the forklift operator to be struck by a board. Hitting a bump or a sudden stop could possibly cause a board to pass through the mast of the forklift and strike the operator. Hoppers are built to contain materials. Anything above the rim is not contained and has potential to fall out.

Potential To Be Struck By

Although the board is not heavy, its free fall speed and weight are enough to do serious damage to parts of your body. Storage areas for green and dry boards provide potential for Struck By events. In addition, there is always potential for Struck By events whenever kiln carts are being moved into or out of kilns.

Kiln Unloading

View and discuss

Remember what Jim Lommen said – we have steel rails, steel wheels and vibration. There is always a possibility that movement of the kiln wagon may cause enough vibration for a board to fall off. Did you hear the squeaking wheels and aching sounds of the movement? That noise is an indication that wear

is occurring on the wheels and rails and that translates into vibration and falling boards.

Kiln Loading

View and discuss

Did you notice the same squeaking sounds when the load was being pushed into the kiln? Vibration can cause boards to fall when a kiln is loaded or unloaded. Did you notice that Jim stayed behind the load as he walked toward the kiln? He kept himself out of the line of fire. Did you notice that Jim observed the path he was walking for obstructions and glanced up at the load as it was being moved. Jim works in a hazardous environment but flawlessly manages his own movement.

Struck By' Boards

So in this example, we have one unsafe condition and one unsafe behavior. What would happen if the stack of boards was secure and stable? Nothing would happen. What would happen if the kiln tender recognized the stack of lumber was unstable and refused to go into the kiln? He would still be alive.

Struck By' Kiln Door

In this case, we have two unsafe conditions and one unsafe behavior. If any one of the three hazards did not exist a fatality would not have happened. Remember, managing the movement of people, equipment, material and energy is essential for a safe work environment.

Struck By' Kiln Door Again

In this case, we have the same two unsafe conditions and the same unsafe behavior. As with most fatalities and serious injuries, we don't learn any new information. Although the last two examples were separated by 14 years, the hazards were identical. We can't control or eliminate the wind and many times we don't even know when it will be a factor. Therefore, it becomes essential to ensure that doors are secure. How about at your facility, do you have a way to secure your kiln doors?

Significant Struck By Exposure

View and discuss

It Happens – You Just Don't Know When!

When a wire rope snaps a number of things can happen. The whipping action of the wire rope is very dangerous. Wire rope clips can become projectiles and even ricochet. Notice the position of the clips after the wire rope snapped.

Line of Fire

View and comment

Wire Rope Clips

This slide shows how wire rope clips should be attached. Notice in the top graphic that the U portion of the clip is on the dead end of the wire rope. All three clips should be in that position for maximum strength. Alternating the position of the clamps

does not provide any benefit. As a matter of fact, it weakens the rigging.

What Do You See Here?

Discuss (Clips not properly attached and no safety latch on hook). What about the coating on the cable – good idea or bad idea?)

Hooks

Read and discuss

Improper rigging and improper use of hooks both contribute to the potential for a very serious struck by incident.

Event Classification

Struck By was the first event classification that we discussed. The second most frequent event classification that seriously injures personnel during kiln operation is called Caught, In, On or Between. Remember the key words in the definition of safety – the key word **movement** plays a strong role in Caught, In, On or Between incidents.

What is the movement in a Caught, In On or Between incident? The person moves into a position where some body part or even the entire body is in the path of one or more mechanical motions.

Read and discuss

Caught In – On – Or – Between

Read and discuss – emphasize the words caught in and between

Caught In On or Between 2

View slide and discuss

Small Group Exercise

Hand out small group assignments and read the incident

Small Group Exercise

Call attention to the blue highlighted word Normally. Obviously, normally didn't work. Whenever, your process is not working normally, that should be a red flag that it is time for all affected personnel to think, communicate and manage the movement of all the people, equipment, material and energy involved in the abnormal activity.

Caught In On or Between 1

This is an animated version of what happened during the incident discussed in our small group exercise.

Event Classification

The third most frequent event classification that seriously injures personnel during kiln operation is called Contact With Temperature Extremes. Remember the key words in the definition of safety – the key word **movement** also plays a role

with the event classification Contact With Temperature Extremes.

What is the movement in a Contact With Temperature Extremes incident? The person touches something very hot or very cold or the person moves from a very hot environment into a very cold environment or vise versa.

Read and discuss

What you can do to avoid contact with temperature extremes

Read and discuss

Here are some examples. Aluminum at 900 degrees looks like aluminum at room temperature. The same hold true for most metals. A hot water pipe looks the same as a cold water pipe. Signage and labeling can go a long way in preventing contact with hot materials.

Temperature Extremes

This video will show numerous sources of temperature extremes in a kiln environment.

Play video

Body's Response To Temperature

When we introduced the event classification Contact With Temperature Extremes we said that moving from a very hot environment to a very cold environment was a safety

consideration. The chart shows what happens to the body when exposed to hot or cold environments. We will discuss in more detail the impact temperature extremes have on the body in a few moments.

Read and discuss

The Regulations

Because entry into hot kilns is necessary in some operations and because the kilns are located in areas that experience extreme cold in the winter, OSHA and some state plans have determined that precautions must be taken to protect the workers who are exposed to those temperature extremes.

Read and discuss

Board Certified In Occupational Medicine

The following is a recorded conversation between a Certified Safety Professional and Dr. Judith Heusner regarding the physiology of being exposed to hot and cold environments.

Play audio

Danger: Extreme Temperature Change

Read and discuss

Hazard - Condensate Pits

Play video

Hot Water Burns

Read and discuss

Fatal Condensate Burns

Read and discuss

These injuries are preventable and what is worse is the fact that nothing new was learned when they happened. We have all the knowledge and technology that is necessary to prevent these serious burns.

These incidents are preventable. As a matter of fact, they are 100% preventable and the starting point is on your work sheet. Look at item #5. All incidents are initiated with movement. Either the person moves to the hazard or the hazard moves to the person. In this instance, the person moves to the hazard.

Think about it for a moment and tell me two common sense solutions for preventing these serious burns.

The Turning Point

Play video and discuss

Unfortunately, a near fatal event was the generator of the turning point in this instance. OSHA and The Timber Products Manufacturing Association are hopeful that this training session with its examples and testimonials will result in a turning point for you. There is a lot to be gained as the next slide will show.

Improvements

Play video

Results like these should be an inspiration to all of us.

If time allows, review completed worksheets with the group.

Quiz

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