LOGGER SAFETY INITIATIVE

Keeping Washington loggers safe.

# Logger Safety Initiative Quarterly Training

## Why am I receiving this LSI Safety Training Packet?

LSI participants are required to annually attend approved LSI Employer Logger Safety program training. There are two parts to the required training: Formal Training and Safety Training (see the attached LSI Training Requirements for more details). This packet satisfies one of the four required Safety Trainings. The LSI employer must ensure that all workers receive four LSI required trainings per year.

## How do I provide the training to my employees?

LSI Employers and supervisors, if delegated, and all employees engaged in manual logging operations must participate in at least four (4) LSI trainings on an annual basis. If you have employees that do ground operations, even if only occasionally, review the "In the Clear Rigging" safety training (found on our website) materials in detail and discuss the scenarios with employees.

## What documentation is required?

LSI employers will document that the training took place as part of their safety minutes. Be sure staff has signed the safety meeting sign-in sheet. The completion of the training will be assessed at the annual DOSH LSI Consultation.

WASHINGTON STATE LOGGER SAFETY INITIATIVE

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## Quarterly Logging Safety Training: Guyline Anchors

## October 30, 2015

This year there were occurrences of yarders tipping over due to inappropriate selection of anchor stumps. Fortunately, there have not been recent serious injuries related to this occurring, but there have been equipment damage and close calls. This training provides an overview of how to properly choose anchors for yarders.

Some of the root causes of the tip overs appear to relate to experience and inadequate training.

- Stumps not being properly notched causing them to pinch off or the notch peeling off.
- Not using twister tiebacks or using them incorrectly.
- Inexperience of the crew or the owner of the logging company using yarders.
- Improper stump selection with poor root structure.

While it's been noted that hooktenders are improving their stump selection and twister tiebacks, consistent training and education is still necessary to avoid problems. Consider your yarder's capabilities and the line-breaking strength when selecting your stump. Even when proper stumps are selected, overloading of lines is occurring and many don't know it is happening.

For more information on safe guyline practices see the LSI Quarter 3 Training – Three Guyline Yarders. You can find the trainings on the LSI website at:
www.lni.wa.gov/main/loggersafety/PoliciesTraining.asp

## Industry Incident

In March of 1989, on the Olympic Peninsula, a 34-year-old shovel operator was killed when the tower tipped over and crushed the cab of the shovel.  A chaser's hand had several fingers amputated as a result of the accident too. The chaser was located between the two machines when the accident occurred and he put his hand against the shovel, thus resulting in the injury.

This photo shows the tower tipped over onto the shovel.

The L&I investigation found that the accident was caused by a chain reaction of several stump failures. The ground was very soft and swampy around one stump, another stump had its notch peeled off, and the lines out to the left were wrapped-and-go-back stumps and the first wrap failed.

This photo shows the stump with the notch peeled off.

While this incident may have happened many years ago, it can still happen today. It is not uncommon today to find similar issues with stump selection and stump failure causing near misses or towers to topple over.

## An Industry Supplied Incident from Recent Days

In March 2015, a swing yarder running a motorized carriage with a 1 1/8 inch swaged skyline without a fuse link tipped over. Fortunately there were no injuries associated with this incident. The hook tender had 25 years of logging experience and 12 years of hooking. The yarder operator had 35 years of experience.

This was the first guyline stump they pulled in this unit. The stumps were adequate, but the ground was soft and the stumps were not tied back. The skyline was out 3,000 feet and skidding 1,000 feet. The turn when the yarder tipped consisted of three logs measuring 14" diameter by 60' long, and three logs measuring 15" diameter by 70' long. The middle guylines were anchored to stumps located on a steep bank with rocky, loose silt soil, and was receiving most of the pull. The turn was directly under the skyline without any side pull, and was fully suspended. As soon as the crew went ahead on the skidding line, the guylines pulled. The middle guylines pulled, causing the right back guylines to pull. The back left guylines did not pull, but caused the yarder to pivot and slowly tip over.

**Root Cause Issues:**

- Yarder was pulling on two guylines.
- Soil was saturated.
- Yarder was running an oversized skyline.
- Guylines stumps were in poor locations.
- Guylines stumps were not properly tensioned.
- Did not make use of equipment or other options for guylines anchors.
- Did not turn yarder.

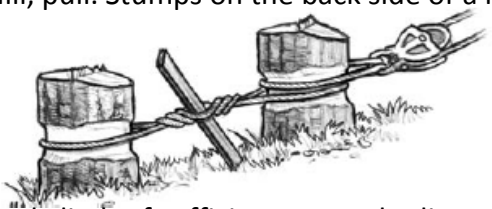
**Recommended Actions by a Private Investigation Outside L&I:**

- Install a fuse link.
- More frequent safety audits.
- Create written guidelines and anchor safety procedures including stump selection and inspection.
- Ensure owner and crew understand procedures.

## Logger Safety Initiative (LSI) Accident Prevention Program Tips:

**Anchoring**

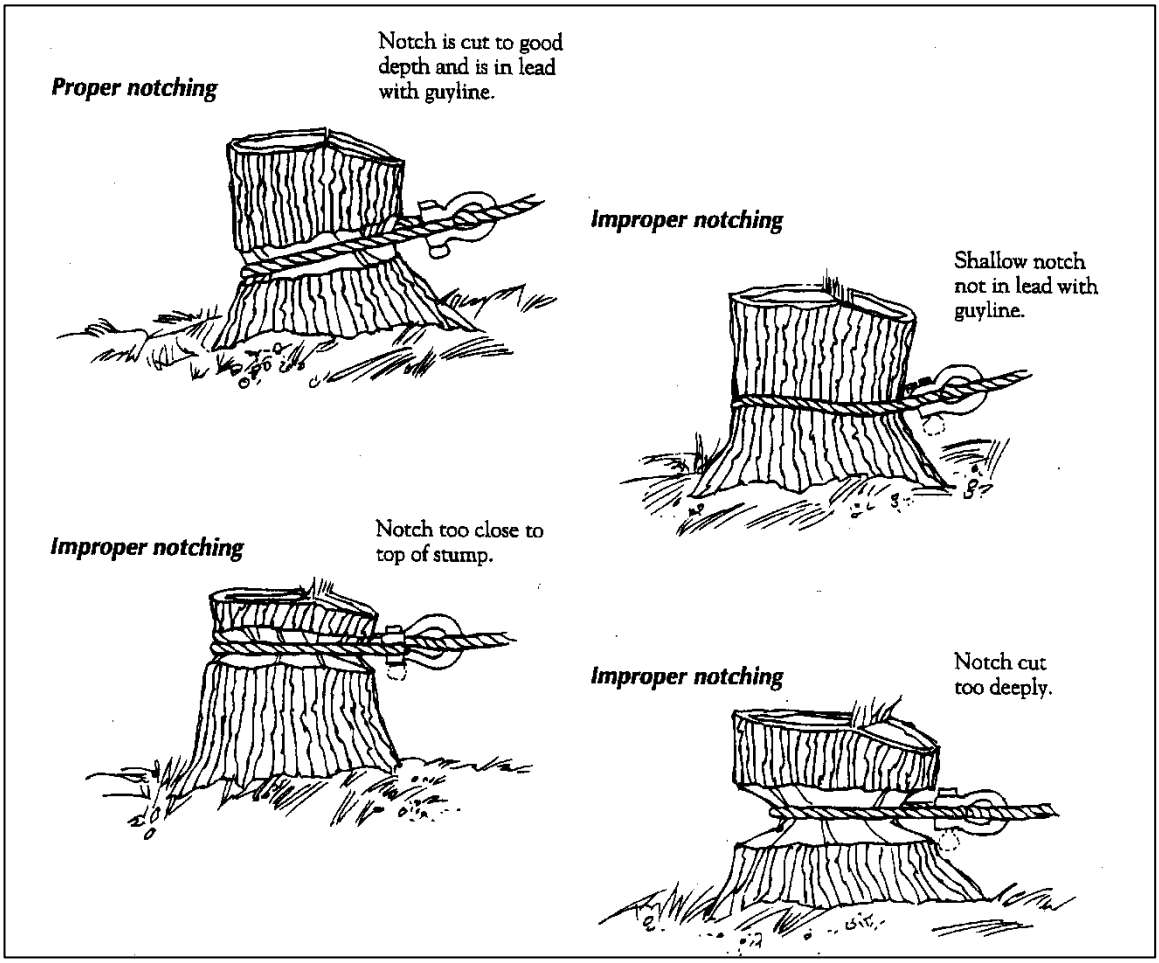
- All anchors must be regularly inspected while the logging operation is in progress. It is recommended that load bearing guyline anchors be inspected daily while the operation is in progress.
- Stumps used to anchor guylines and skylines must be carefully chosen for position, height, and strength. When necessary, stump anchors must be tied back to distribute the load.
- Each species of tree has a different root system and grows differently according to the soil moisture, density, and slope. The holding power of a stump increases with soil depth and density. Never assume the stumps in one setting will be the same as stumps in the next setting.
- Stumps are generally strongest with a side pull rather than an upward pull. On slopes, stumps have more root structure on the downhill side, and are therefore stronger on an uphill, rather than downhill, pull. Stumps on the back side of a ridge, with an upward pull, are stronger.
- **Twister tiebacks** only take a few minutes to set up. To do it well, consider the following guidelines:



  - Use a good, strong sapling or sturdy limb of sufficient strength, diameter, and length for twister stick.
  - Locate the twister line close to the top of the front stump, unless there is concern about the roots pulling out while tightening the tieback.

- Notch secondary anchors to prevent line slippage.
- Wrap a piece of line around the front and back tree, and secure with a timber hitch wrapped under several times. Insert a sturdy stick in the opening created by the line and twist the line over itself until taut. Use a minimum of two wraps. Wedge the stick in the ground so it holds the wrap in the line.
- Use caution when applying the twister stick. Keep it firm. Unexpected release can cause serious injury.

- **Stump anchors must be adequately notched to keep the line in place and not adversely affect the stump strength**.
- When notching a guyline stump, keep the notch in lead with the guyline, and with enough wood above the notch to prevent slabbing. The notch needs to be as low as possible, but do not cut off the roots. By placing the notch low, less leverage is exerted that could pull the stump out of the ground.
- Feller bunchers typically create stumps that are too short to put in a proper notch. Potential guyline anchors should be marked ahead of time and buncher operators instructed to leave a taller stump.



- Stump anchors when spiked must be barked where attachments are to be made.
- When spikes or cable clamps are used, guylines or skylines must be anchored with at least two and one-half wraps around the stumps. Wraps must:
    - Be well secured with at least eight spikes or six staples in sound wood on the first and last wrap; or
    - Have the end of the line secured with two wire rope clips on lines up to one inch diameter and three wire rope clips on lines one inch diameter and over.
- All anchors must be regularly inspected while the logging operation is in progress. It is recommended that load bearing guyline anchors be inspected daily while the operation is in progress.
- Mobile equipment may be used to anchor skylines, running lines and guylines, provided the weight of the machine or other methods are used to ensure machine stability for all applied loads.

## Business Management Best Practices - Directly from the Industry

Two loggers shared their knowledge for this quarter's training. One logger with over 30 years' experience and another with over 40 years in the industry provided their advice and recommendations on anchor selection and preparation.

- When selecting guyline anchors consider the following:
    - Anchors are at correct spacing and equal distance.
    - Look for the best stumps available.
    - Ensure your stump selection allows for your guyline angles to be correct.
    - Check your stumps when you move your yarder angles. Does a new stump need to be selected to ensure your angles are correct?
    - Historically Douglas Fir stumps that are solid and have a sound undisturbed root system have been good candidates for anchors.
    - When stump anchors appear marginal, consider rigging additional guylines.
    - Check all of your stumps before yarding. If you turn your yarder, check them again.

- When selecting twister tiebacks consider the following:
    - Put a decent sized twister tieback behind the guyline stump.
    - Put in about 3-4 stands of line; four is preferred.
    - Make sure it's as tight as possible before you put the stick in.
    - Use the least amount of twists to make the tightest possible tieback.
    - If more twisters are required, use a crow's foot. Ensure they are kept in lead with the pull of the guyline.

    - If you question it, tie it back.
- Stump notching best practices:
    - Notch the lead-end high-side stump.
    - Point to the top of the tube.
    - Notch as low as possible at the back of the stump.

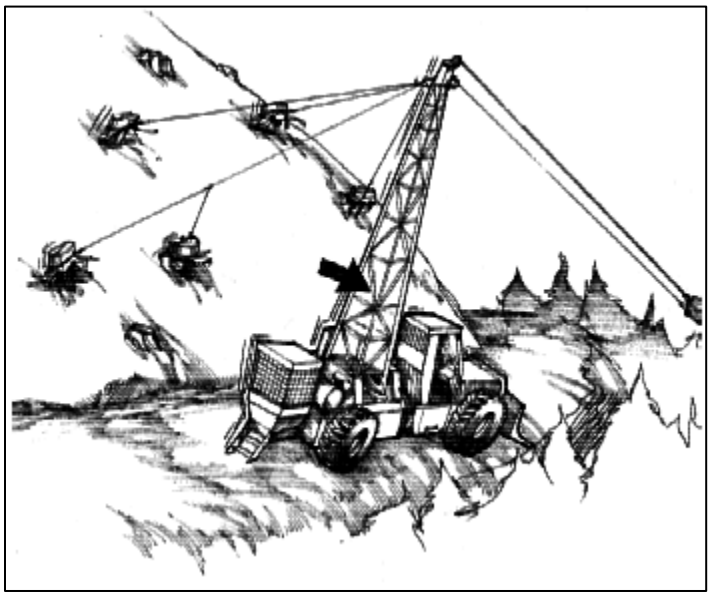
- If there are no good stumps available use a deadman or CAT
    - Make sure a deadman is properly placed and pulling against dirt.
    - When using a CAT, ensure the line and blade do not come into contact with each other causing a rub. Often, if the line rubs against a bare blade it works like a knife as it rubs against it.

## Case Study from Worksafe BC:

1) A yarder was working from a narrow (14') road right of way, when all the stump anchors were pulled. The force of the anchors releasing propelled the yarder over the 78% slope road edge. The yarder operator jumped to safety as the yarder tumbled 500' down the slope.

   **Prevention:**

    - Inspect condition and stability of stumps on a frequent basis.
    - Check condition of the ground that the stumps are anchored in. If the ground hold the stumps is unstable, use an alternative method to anchor guylines.

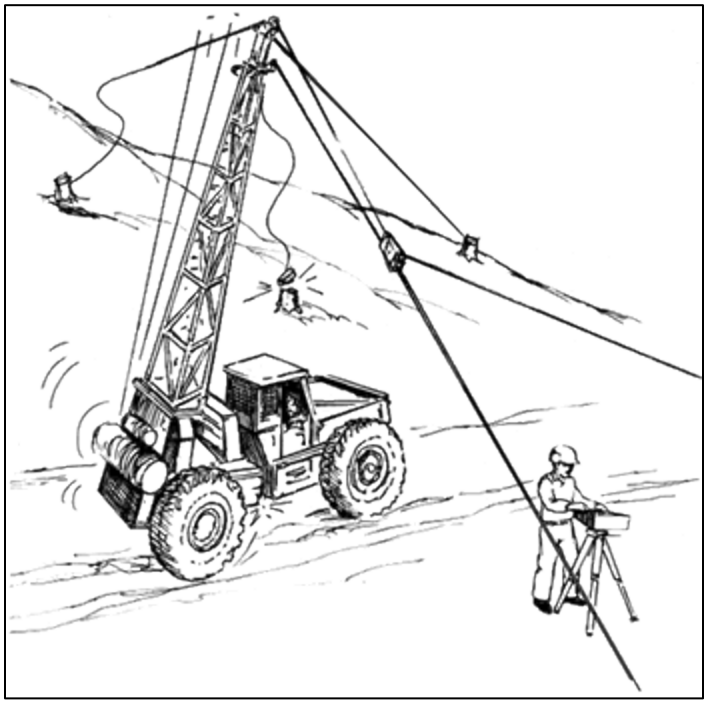


*WorkSafeBC Alert#96-05*

2) A yarder engineer with several years of experience was killed when two guylines failed, allowing a yarder to topple on him. The engineer, using a remote control operating console, was standing 10' uphill of the yarder when the accident happened. The yarder was secured by three cable guylines attached to stump anchors. As logs were being yarded in, two of the three stumps failed. The holding wood above one stump was completely stripped off, allowing the guylines to pull free from the stump. Another stump pulled out of the ground and overturned, allowing the second guylines to fly free. The stumps were not properly positioned, causing the load to be unequally distributed.

**Prevention:**

- Ensure all workers receive adequate training in the safe performance of their duties.
- Select anchor stumps that are about equal distance from the yarder, so they provide equal load distribution.
- Use adequate stumps with proper notching and a type of guylines that will ensure a maximum bight on the stump.



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