Safety Alert

Arm Laceration Placing Stemming

On 6/30/2018 at approximately 3:45 PM a laborer in the rock ditch crew received a complex laceration to his right forearm when he slipped, and a self-retracting safety knife contacted his skin.

In preparation for blasting, stemming consisting of small pieces of gravel is placed into the predrilled blast holes of an alternating 3 ½' pattern. The stemming is transported to the blast holes in a woven plastic sack and weigh 15-20 lbs. The woven plastic sack is prefilled and sewn closed by the supplier.

Prior to beginning the stemming task, the laborer completed miscellaneous tasks for the morning and early afternoon hours while the blast holes were drilled and loaded. To transfer the stemming, the laborer was working in tandem with another laborer and working their way down the hill (each laborer filling a blast hole every 7'). Prior to the incident the laborer had filled approximately 50 blast holes on the 22°-25° degree hillside.

In completing the task, the laborer would pick up the sack of stemming with his right hand, leaving slight contact of the bag with the ground. The laborer would utilize an self-retracting safety knife to cut an approximate 3" hole at the corner of the nylon sack to allow for the flow of stemming to the blast hole. The intended manner of utilizing the self-retracting safety knife is to press the trigger of the knife forward with the thumb, place the blade on the intended cutting surface, release the trigger, and complete the cut away from the body; when completed in this manner the blade retracts when pressure on the blade is released from removing the blade from the cutting surface.

During the cutting process, the laborer stated he made an insufficient cut on his first attempt. The laborer stated he went for a second attempt with left thumb on the trigger of the knife when he slipped/lost balance on his left foot (downhill side). The laborer stated he caught himself with his right arm (uphill side). When slipping/losing his balance, the laborer stated that the blade of the self-retracting knife contacted his right forearm.

Root and Contributing Causes

#	Factors	Description
1	Work Environment	While the laborer was filling the blast holes he was working his way down a Class B Slope ranging from 22°-25°
2	Work Environment	While the laborer was filling the blast holes he was working on a rock/loose surface
3	Human-Tool Utilization	While attempting to make a second cut on the stemming sack, the laborer extended the blade for the self-retracting knife too far away from the cutting surface.
4	Management: Human-Tool Utilization Training	Current training on proper use of self-retracting safety knives NI
5	Management: Work Direction-Process	During the process the laborer would pick up the sack of stemming and make the cut, where leaving the sack fully on the ground would allow the non-cutting arm to be free.

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Characteristics of Self-Retracting Knives

Not all self-retracting knives are the same. The self-retracting knife in this incident allows the self-retracting ability to be negated when the thumb is kept on the trigger (blade does not retract when pressure of the cutting surface is removed). The self-retracting safety knife involved in the incident appeared heavily used. There was limited/slow retraction of the blade when thumb/trigger process occurred correctly. When the cover of the knife was taken off, bits of debris/residue were found inside.

Corrective Actions and Path Forward

1. **Stemming bags are to be placed near holes in the first part of the task. The bags are then cut open while the bag is laying on the ground. The cutting tool is then placed in appropriate transport position. The bag is then picked up to transfer the stemming.**
2. **Whenever orientation of workspace/workflow is practical, stemming should be transferred working uphill.**
3. **Self-retracting safety knives that allow the blade to stay out with continued pressure on trigger replaced with self-retracting safety knives that retract when pressure is released on blade.**
4. **Coaching and training sessions on self-retracting knife use.**
5. **Emphasis on proper footing when working on slopes.**
6. **Emphasis on completing tasks in a deliberate, step-by-step, manner; one task at a time.**

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