Evaluation of Exte Com90 Automated Log Load Securement System

The motion of throwing and securing log load wrappers can cause a great amount of stress on drivers' shoulders, with overexertion-related musculoskeletal injuries being quite common among log truck operators. WorkSafeBC has reported 41 overexertion injury claims from 2018 to 2023. Of these injuries, shoulder injuries related to throwing wrappers is a major contributing factor. Load securement related injuries have cost WorkSafeBC more than $2.1 million in the last 6 years. These claims costs include injuries related to throwing, removing, cinching, and tightening wrappers as part of the log load securement process. In addition to WorkSafeBC claims, log hauling contractors suffer lost revenue due to missed trips with load securement related injuries. Of note, the contractor that participated in this study has a driver injured due to load securement related activities, with lost time of 9 months to date. Lost time costs from this were $75,000 and could have reached up to $385,000, if the fleet owner could not find a replacement driver. Therefore, the BC Load Securement Working group (a subcommittee of the Log Truck Technical Advisory Committee) initiated a project to evaluate Exte's Com90 automated load securement system's suitability for eliminating load securement related injuries in BC log hauling operations.

Project Objectives

- Evaluate Exte Com90 compliance with CVSE and BC regulatory requirements.
- Study the Exte Com90 automated load securement system in a BC log hauling environment.
- Explore the possible adaptations of this system to address BC log hauling needs.
- Examine safety and possible productivity improvements in cycle time due to Com 90 system and perform a cost benefit analysis.

System Description

Exte's Com90 consists of bunk(s) with retractable upper stakes and lashing arms that restrain the load as shown in Figure 1. The system is hydraulic and is controlled by the driver using a remote-control unit. The tension on the load is automatically monitored and controlled throughout the journey from loading to the unloading site. Maximum stake height from the bunk is 3 m and minimum is 1.7 m within the load envelope of Com90 system.

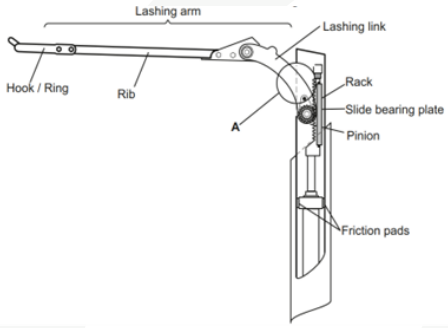

Figure 1. Schematics of Exte Com90 (Image source – Exte reproduced with permission)

Operational Performance

The system was put in operation in September 2024, with a driver having over 40 years experience operating a logging truck. As of February 12, 2024, the truck travelled 40,000 km with 1,000 engine hours and completed 165 successful trips using the Com90 system. On average, two trips a day were completed and 6,700 tonnes of logs (3 to 6.7m length) were transported.

Overall, the system worked very well. A few minor issues were addressed during the trial which included the loader having to occasionally grab the sides of logs from the top of the load to ease off the pressure on the stakes while the Com90 was retracting the stakes to create appropriate tension on the log bundle.

During the load tensioning process, the display in the cab (Figure 2) lets the driver know whether the required tension on each bunk has been achieved or not. In this way, the driver and loader operator worked together to ensure proper system tension and load securement.

Figure 2. In cab display

During the five months study period, the driver only had to throw the backup set of wrappers on six occasions. Some of the issues were: 1) Initially the lashing arms of front bundle would not bind the load completely, which was later resolved with the use of loader assistance 2) a hydraulic oil leak, and 3) a hose damaged during operation.

During the trial the system was subjected to +31 °C to -28 °C. In summer, the system was exposed to mud and dirty conditions. The driver kept the system clean with occasional cleaning of the bunks and sweeping the dirt off the Com90 components. In

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winter, the driver reported the system response was slightly slower while operating in sub-zero conditions.

Potential Adoption

Although the system performed well over the term of the trial there is some room for improvement. To address the intermittent case where the stakes failed to fully retract, the contractor installed a higher-pressure pump in consultation with the manufacturer. In order to maximize payload 2.9 m (9'6") bunks would be particularly beneficial, particularly when hauling pulp logs and saw logs less than 5.2 m (17'). Exte has indicated 9'6" wide bunks will be available as an option in the future.

In conclusion

The Com90 system met both regulatory and operational requirements, performed well, and overall the driver liked the system. The system also provided on average an 18 min time saving per trip and reduced the driver's exposure to safety risks related to the load securement process. The Com90 appears to be a viable solution for the BC forest industry to improve efficiency, reduce risk, and eliminate injuries related to log load securement.

The final project report is expected to be released in June of this year and has a detailed analysis of the systems performance including a cost benefit analysis.

Extreme Heat and Worker Safety

In recent years we have seen an increase in the unpredictable nature of summer weather conditions. Recently BC broke numerous heat records due to a heat dome which led to an unprecedented number of heat related illnesses and fatalities. People who work outdoors can often be at the highest risk for heat-related illnesses and injuries during hot summer conditions. High temperatures and sunshine can be a wonderful thing when enjoying time at the lake or on the beach but can cause serious health issues. The wide variety of job roles and often rigorous physical activity in forestry can put workers at risk for heat-related illness if not managed properly.

There are three main causes of heat stress and illness:

1. The environment

Radiant heat from direct or indirect sunlight , air temperature hotter than skin temperature (warms a worker up) and high humidity (makes it harder for a worker to cool down).

2. The work

The more active you are, the more heat you will produce.

3. The worker

Conditioning (regular work in hot environments makes workers less prone to heat stress), poor health, and excess clothing or inappropriate personal protective equipment (trap heat and prevent cooling). As a worker's body heats up it loses fluids and salt through sweat. As workers dehydrate, they are less able to cool themselves down. The most serious types of heat-related illnesses experienced by workers are heat exhaustion and heat stroke.

Heat exhaustion generally develops when a person is working hot weather and does not drink enough liquids.

Signs

Symptoms of heat exhaustion may start suddenly, and include:

- Thirst, heavy sweating, high body temperature, pale, cool and moist skin, dizziness, feeling faint, fatigue, muscle cramps or weakness, nausea, and headache.

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Heat exhaustion may also quickly develop into heat stroke. Heat stroke, which occurs when the body fails to regulate its own temperature and body temperature continues to rise, often to 40.6°C (105°F) or higher. Heat stroke is a medical emergency. Even with immediate treatment, it can be life threatening or cause serious long-term problems.

Symptoms of heat stroke include:

Skin that may be red, hot and dry, heavy sweating or sweating may have stopped, very high body temperature, fast heart rate, confusion, seizures, nausea or vomiting, difficulty breathing, and loss of consciousness.

A key indication of heat stroke is the body often stops trying to cool itself, so the person has hot, dry, skin whereas they are still sweating with heat exhaustion.

Prevention is the best option for dealing with heat-related illnesses in the workplace. Prevention includes monitoring current weather conditions and forecasts, taking adequate rest periods in a cool location, acclimatizing to the heat, adjusting the type, timing and duration of work, wearing sunscreen, wearing appropriate protective equipment, knowing the signs of heat-related illness, do not work alone in extreme heat, and drinking plenty of fluids.

If prevention did not work and a worker is dealing with heat-related illness, consider the following:

First aid for heat exhaustion includes:

- Administer or get first aid, stay with the person until help arrives, move to a cooler location, remove as many clothes as possible (including socks and shoes), apply cool, wet compresses/towels or ice to head, face or neck, encourage the person to drink liquids.
- It is also important to remember to not cool too much. If the person starts to shiver, stop cooling.

First aid for heat stroke includes:

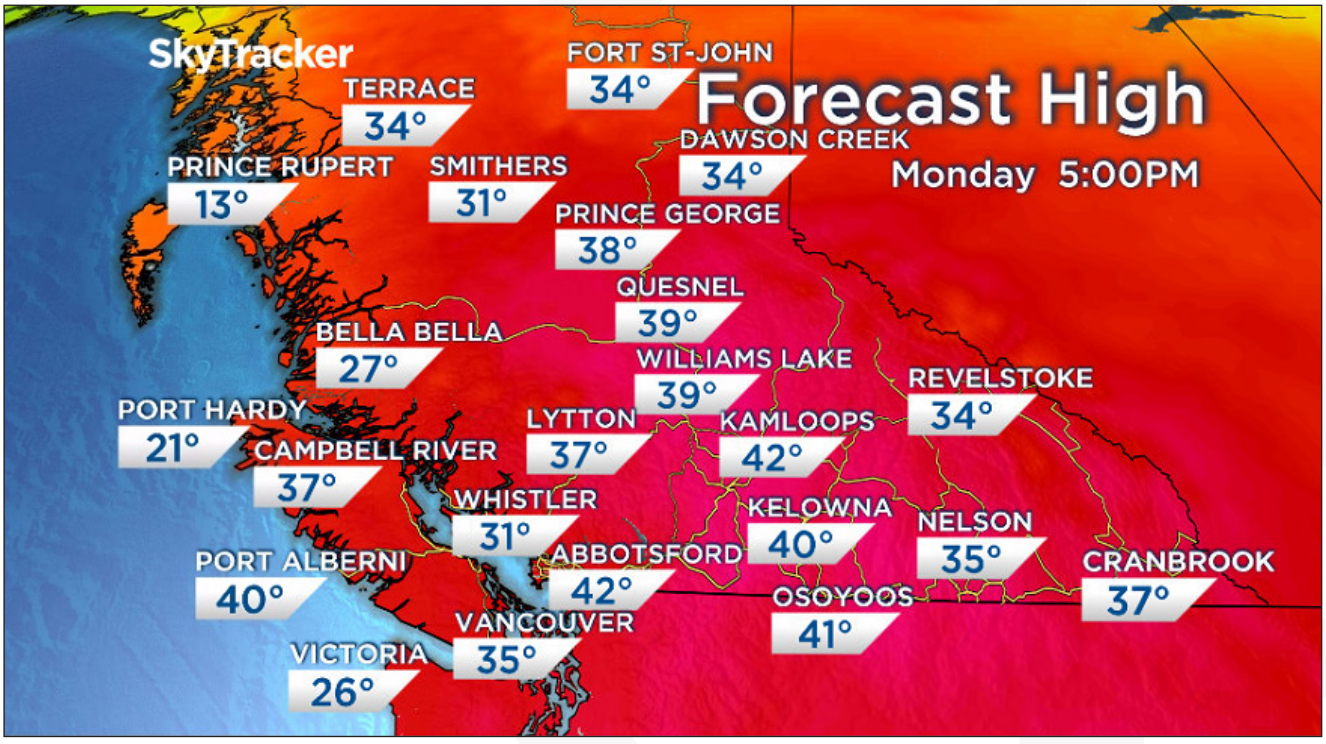
The treatment for heat stroke is similar to heat exhaustion with the following exceptions:

- This is a life-threatening condition, get medical treatment immediately and do not try to force the person to drink liquids.

With summer here, now is a good time to think about how to prepare for and work safely in the heat.

Additional Information:

- Heat stress - WorkSafeBC
- HealthLinkBC – Heat-related Illnesses
- HealthLinkBC – Heat Stroke
- Fit to Log Poster – Maintaining Hydration
- Fit to Work – The BC Forest Safety Council
- Weather forecast - British Columbia - Weather Conditions and Forecast by Locations - Environment Canada



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