

Chip Trailer Auto-Tarpping Observations on Two Prototype Systems – Part 1

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Introduction

For B.C.'s bulk haulers, tarping-related injuries are resulting in a significant number of time-loss incidents. WorkSafeBC's data show average tarping-related injury claims at 79 per year, resulting in average costs of \$1.7 million per year (Source: WorkSafeBC - data include chip and flatbed trailers). One way of reducing tarping-related injuries is to automate the tarping process. FPIinnovations, in cooperation with the Bulk Haulers Injury Elimination Task Force facilitated by the BC Forest Safety Council, reviewed two prototype auto-tarpping systems in 2017. This Info Note documents initial observations for two auto-tarpping systems that two B.C. companies are developing for flow-through type B-trains.

Safe Tarp system

Tycrop Trailers, a trailer manufacturer based in Chilliwack, has developed a prototype of an electrically operated system that is robust and designed to account for heaped loads (Figure 1). The pivot arm assembly is in an enclosure and the lid opens during the covering and uncovering of tarps. The roller assembly is designed to fit within the 10 cm (4") allowance for load securement components.

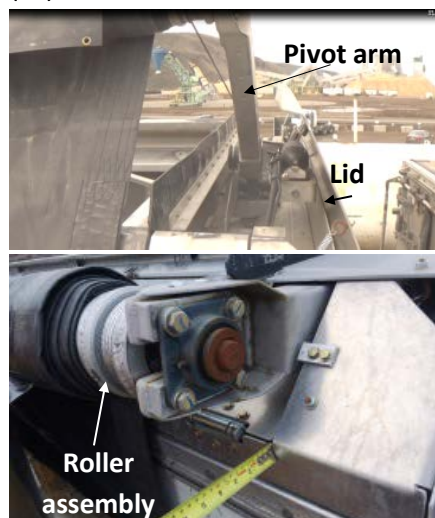


Figure 1. Safe Tarp (Patent Pending) in operation.

The manual operation of the tarp is incorporated in the design if the auto tarp fails to open or close. Tycrop simulated the life cycle wear using a test bench to perform multiple cycles of opening and closing a tarp before retrofitting the system in an actual trailer.

The Safe Tarp prototype system was retrofitted on top of the rear trailer of an Arrow Transportation B-train for testing purposes (Figure 2). The system increased the overall height of the trailer by 23 cm (9"). Commercial Vehicle Safety Enforcement (CVSE) approved the use of this trailer on a Highway 5 haul route from Kamloops to Vavenby for a short duration only, from mid-February to July.



Figure 2. Test truck mounted with electrically operated tarping system on the rear trailer.

The driver was complimentary about the system. Time savings with the rear trailer prototype was minimal, but is expected to improve when the complete trailer is outfitted with the new system. Also, due to the additional height of the prototype rear trailer, the driver currently has to temporarily lower the suspension pressure in order to fit under the bin at the mill during loading. The system operated well in moderately windy conditions; the wind speed was 23 km/h (14 mph). No failures were reported during the test period. Better securement of the inner skirt (Figure 3) and other improvements will be incorporated in the next version.

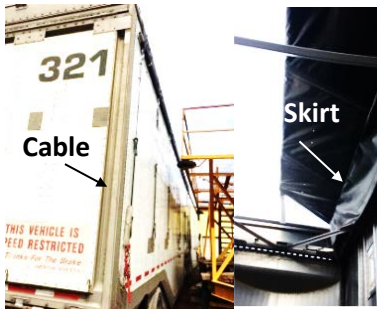


Figure 3. Safe Tarp cables and skirt.

Tycrop is currently improving its design and making modifications to fit within legal height at optimal cost. The improved design will be incorporated in the lead trailer only and the existing design will still remain in the rear trailer; however, the height of the rear trailer will be legal height.

AutoNet system

Elite Transport, a bulk carrier based in Prince George, has developed a modified version of a hydraulic half-panel auto-tarping system. This system is customized to accommodate any heaped load on its 7-axle chip hauling trucks with walking floor (Figure 4). Elite's design process included testing several versions based on operational performance and drivers' feedback.



Figure 4. Elite Transport's auto-tarping system on its 7-axle chip trucks with walking floor.

The currently retrofitted auto-tarping system is designed to be within CVSE's allowable additional height and width clearance for load securement systems. The system consists of 1.5 m (5') wide half-panels, made of flexible net-type tarps supported by steel cables and actuated with hydraulic motors that are mounted on top of the trailers (Figure 5). The working zone for these panels is around 1.37 m (4.5'). The overlap of the left and right panels is 0.5 m (19"). The lengthwise cables (two on each side) and thick widthwise cables help to keep the load sealed. The added weight for this system is around 227 kg (500 lb.); however, the additional weight is offset by the removal of ladders and other climbing accessories.

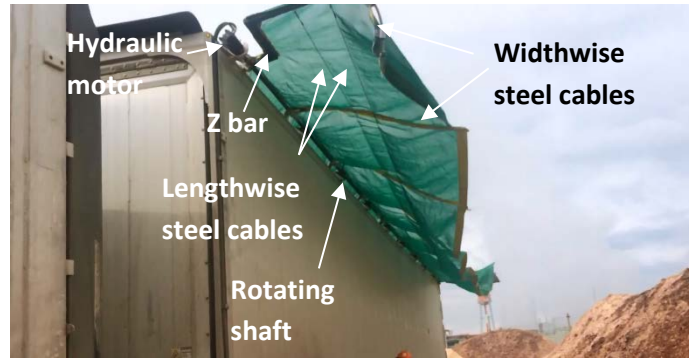


Figure 5. AutoNet hydraulically activated auto-tarping system.

Elite Transport operates mainly in Prince George with chip trucks making an average of five trips per day. The trucks make an average of three trips per day when loading from Canfor's Polar mill, which is 75 km (47 miles) from town and mostly a highway route. Drivers' feedback on auto tarping was positive and no maintenance issues were reported to date. Figure 6 illustrates the auto tarping of both trailers in actual operation. The driver side panel folds first followed by curb side panel. The system took around 20 seconds to tarp both trailers.

With its initial success for 7-axle chip trucks, Elite is currently working on a next-generation AutoNet system that will be electrically actuated and retrofittable on existing chip B-trains.

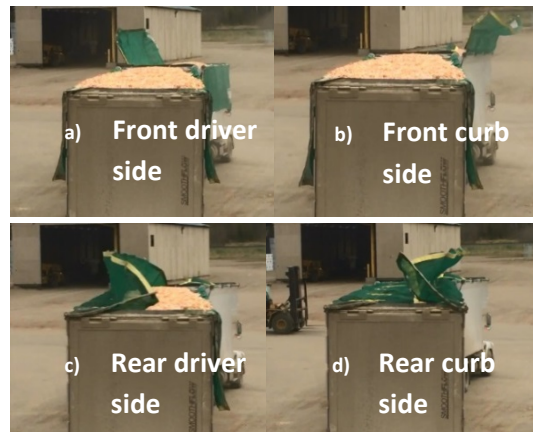


Figure 6. Auto tarping at loading site of Carrier Mill, Prince George.

Summary

Both the Tycrop and Elite systems seem effective in reducing the risk of tarping-related injuries. As both systems progress further through the development stages, FPInnovations will provide more updates. For more information, please contact the author by telephone 604-222-5732 or email mithun.shetty@fpinnovations.ca.