SAFETY ALERT

Yarder Stabilising Ram Failure Incident

FOREST INDUSTRY SAFETY COUNCIL
TOGETHER TOWARDS ZERO

Thunderbird TY50/70 Towers – Rope Retrieval

The forestry sector has long relied on Thunderbird TY50 and TY70 tower yarders—machines designed to be light, transportable, and efficient. However, a serious harm injury of a worker, has highlighted a critical safety concern that demands immediate attention.

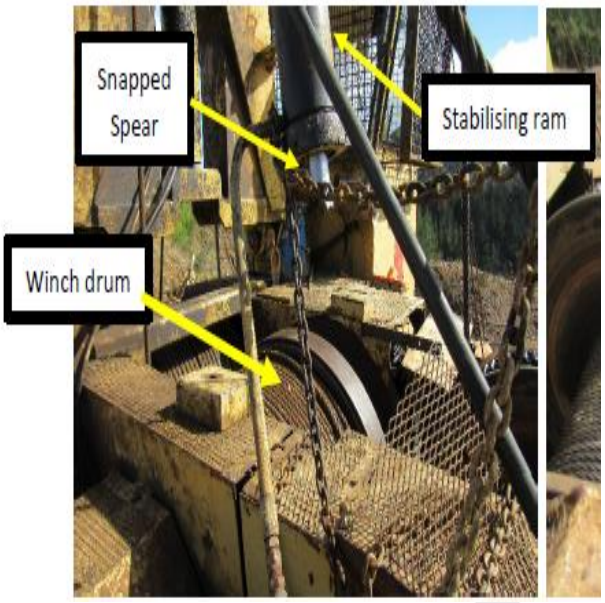
BACKGROUND

The yarder was being prepared to shift. Running lines and guys had been retrieved. The tower was pushed into vertical position and the stabilising ram locked. The guy ropes were hooked on the chassis and ratcheted up to remove excessive slack. However, during the rope retrieval the tail rope over-spooled or "birdnested". A plan was then made to untangle the rope and run the tail rope out so it could be correctly fleeted back onto the drum. A grapple operator was positioned in front of the hauler to pull the rope out and then manage rope tension as it was wound back on. Another worker was deployed to sit beside the drum and assist fleeting the bottom layer and a 3rd worker, the hauler driver, had the tail drum engaged, and idling dead slow in 1st gear. The yarder driver was observing the drum and stabilising ram through the cab side window. The rope was being wound slowly onto the drum, and the first layer was half completed when without warning the spear on the stabilising ram snapped. The broken spear shot forward and landed on the workers hand who had been positioned near the drum. The injury was severe requiring four fingers to be amputated

Investigation findings

- The investigation revealed that the incident was the result of a stabilising ram failure.
- It identified that the Thunderbird manual prescribes the slackening of all guylines before rope recovery, therefore the tower was not supported by guylines when the stabilising ram failed.
- Also, the stabilising ram spear had been replaced with induction-hardened steel rather than the original mild steel design. Induction hardened steel provides excellent wear resistance and strength but does not have the same ductile microstructure of mild steel, which allows it to deform (bend or stetch) significantly under stress before fracturing, it absorbs energy well.

Figure 2. Close up of the hauler showing snapped spear



Key Recommendations for TY50 and TY70 Tower Yarders

1. **GUYLINE SAFETY:** While Thunderbird manuals allow slackening all guylines and locking the pole before rope recovery, it is recommended to keep at least one rear guyline in place to prevent tower collapse if the stabiliser ram fails.

2. **STABILISING RAM SPEAR:** Owners must verify the steel grade of stabiliser ram spears. It is recommended that a replacement spear should be consistent with the original mild steel composition with good energy absorbing ductile properties.

3. **LAGGED DRUMS:** Rope fleeting exposes workers for 15–20 minutes. Lagging drums reduces this risk. Owners should consider replacing at least the front drum when machines undergo major servicing.

4. **ANNUAL INSPECTIONS:** Towers must be inspected annually by CBIP-certified inspectors. Inspectors should be briefed on the Kohurau incident and the importance of spear verification and ram integrity.