



## **Equipment Rollovers OHS Considerations for Prevention and Emergency Response In Forest Operations**

The following information has been developed to specifically address prevention and emergency response to timber harvesting equipment rollovers. This information can be used to supplement current safety management system documents and process.

### **Planning Responsibilities**

- Prescription and logging plan suitable for conventional harvesting operations considerations must include; season of harvest, slope %, slope stability, terrain, soil texture, coarse fragment content, debris, rocks, blowdown
- Operating limitations and restrictions identified: Shut down requirements established (rainfall, snow, dry conditions) if required
- Emergency response considerations including; access to location, barriers to first aid, emergency communications requirements

### **Supervisor Responsibilities**

- Prework conducted with all personnel including identification of locations where there is the highest risk of a rollover
- Steep slope procedures reviewed with operators
- Operators are qualified and competent for the terrain, equipment and conditions
- Communication protocols working effectively
  - Consider communication problems when machines roll and crushed/bury antennae
- Worksite plan includes consideration of integration of phases that are suitable for the worksite and reduce risk to workers
- Emergency response plan includes extraction of equipment operators
  - Proximity between operators
  - Check-in procedures
  - Location of crews and equipment



- Support machine and personnel are available and are located such that they maintain a safe distance but have the ability to rapidly respond to an emergency
- Access trails are identified, assessed and established where required
  - Trail must provide access for a support machine to reach the area of operations in a reasonable time frame to assist in an incident

### **Operator Responsibilities**

- Review and understand harvesting plan
- Report unsafe conditions
- Refuse unsafe work
- Do not operate in conditions where not competent
- Recognizes hazards associated with equipment rollover
  - Must include; stumps, debris, rocks covered by debris or snow
  - Must include; terrain, unstable soils and slopes
  - Mechanical failure
- Understands and has copy of ERP
- Completes inspections which must include but not limited to; escape hatches, communication device(s), fire suppression equipment, seatbelt
- Wears seatbelt
- Wear PPE

### **Equipment Hatch Inspection**

- All machine doors are unlocked and functioning properly
- Inspection of escape hatches must include:
  - Opens freely (from inside and outside) without use of tools
  - Free of obstructions (nothing hanging off of the latch handles including cords or items blocking access to the hatch)
  - Top of the hatch free from debris and defects that may cause the hatch to be inoperable or stuck in place
  - Latching tensioner
    - Not over tightened (*Hatch should stay securely in place during regular machine operation, but not impede the operator from operating the latch and opening the escape hatch.*)



- Latches
  - Ensure they are free of defects and open properly (*no broken latch handles, all latch components in good condition and operate smoothly with no issue*)
- Hatch seal
  - Ensure the seal around the hatch is in good condition and not worn out or torn

*It should be noted that guarding, paint and equipment wear may impact hatch operations.*

## **Emergency Response**

An Emergency Response Plan (ERP) must be in place and specific to the worksite. An ERP for worksites where there is a risk of equipment rollover must include the following considerations:

- Barriers to access (to equipment)
- Accessing and extracting the operator:
  - Use of support equipment to right the machine
  - Removal of a window and/or cab guard, or part of the cab
  - Chains, straps or cables, and shackles
  - Cutting equipment such as a saw or torch

If a saw or cutting tool is being considered or utilized:

- Other forestry machines and/or pickups should also be equipped with an auxiliary hand-held cutting tool (aid in extraction of operator from outside the machine)
- Operators must check to make sure the tool is in good working condition at the start of the shift
- The tool must be properly secured in an easily accessible location
- It must not be used for other purposes
- The battery should be fully charged with a charged spare battery
- Battery charging unit should be hard wired to the machine's electrical power
- The operator must be trained and should practise using the tool
- The tool should be inspected regularly and have scheduled maintenance
- There should be gloves and safety glasses/goggles with the tool



## **Emergency Response Training and Drills**

- Machine operators conduct monthly drills extracting themselves from machines using escape hatches
- Machine extraction training completed by all crew
- ERP drills conducted on a regular basis (minimum annually) and include all worksite crew/staff. As a minimum, one drill annually must include machine operator extraction exercises
- Training regarding proper use and maintenance of extraction i.e. cut off saw, angle grinder etc
- Fire suppression training (equipment)

## **Upset Conditions**

**In the event of upset conditions (equipment breakdown, hazard assessment) always:**

- Stay calm
- Assess hazards
  - Address risk

### **Equipment Breakdown on Steep Slopes:**

Mechanical breakdown on slopes can increase the risk of incident. Assess hazards with consideration to:

- Machine stability
- De-energizing equipment including attachments
  - Lower boom / blade / attachments
  - Releasing load
  - Changing load position
- Summoning assistance
- Lockout procedures
- Safe egress from machine
- Hazard identification



## **Fire: Prevention**

- Remove forest debris from intakes, engine compartment, inside the machine belly pans, lower machine structures, and areas close to the engine and fuel and hydraulic systems
- Inspect engine exhaust components for leaks during daily lubrication and maintenance periods. i.e. manifolds, loose or missing bolts/brackets, clamps, leaking gaskets, guards and shields, rusted or cracked pipes and mufflers
- Regularly inspect electrical cables, exhaust components and hydraulic cables for damage
- Maintain protective shields, covers, screens and belly pans to prevent the accumulation of debris
- Immediately clean, grease, hydraulic fluid, lubricating oil and fuel spills
- Check for worn or eroded fuel and hydraulic lines
- Use non-flammable solutions for cleaning machine components
- Consider the use of fire resistant hydraulic fluid

## **Suppression**

- Keep a hand held fire extinguisher in cabs of machines and pickups
- Ensure all operators are trained in using an extinguisher and fighting a machine fire
- Fire suppression systems should have:
  - Manual as well as automatic actuation
  - Audio and visual warning prior to agent discharge
  - Spot and linear heat detectors
  - Automatic engine shutdown when suppression system is discharged
  - System certification by independent North American certifying agency (Preferably Factory Mutual)

## **Resources:**

ERP Docs - <http://www.bcforestsafe.org/node/2585>

Steep slope Planning - <http://www.bcforestsafe.org/node/1938>

Safety Meetings - <http://www.bcforestsafe.org/node/116>

TigerCat Fire Safety:

[https://www.tigercat.com/wpcontent/uploads/2014/08/safety\\_fire\\_prevention.pdf](https://www.tigercat.com/wpcontent/uploads/2014/08/safety_fire_prevention.pdf)