

11 July 2005
Issue Number 0505

Paper Machine Breast Roll Fatality

We have received the following Safety Alert, which was issued by the Australian authorities. The photographs and model were used to explore the incident events.

25 May, 2005

An employee was fatally injured after being struck by part of the paper machine breast roll.

The Incident

The day crew had commenced the task of a wire change at approximately 5.00PM and two additional crew members had commenced work on overtime to assist with the shut.

The day crew had lowered the breast roll, removed the old wire fabric, draped the new wire fabric and then handed the task over to the evening crew at 7.00PM. It is not unusual for partly completed tasks to be handed between crews during planned shuts.

As the breast roll was being raised into position at approximately 7.30PM, there was a loud crash and the breast roll swung back and fell to the machine sole plates adjacent to the wire pit.

The employee was observed to be lying injured on the machine hall floor adjacent to the sole plate. These injuries proved to be fatal and the employee was later declared deceased at the scene.

It is believed, from the evidence gathered, that the employee was observing the operation from near the breast roll – possibly preparing to swing the retaining arm into place. Another crew member was operating the air motor winch control lever. Other crew were in the vicinity to assist with tasks associated with fitting the wire.

Investigation

A team that comprised an independent chairperson; corporate representative; representatives from two unions on site and the OHS&E Unit completed a comprehensive incident investigation.

The investigation team determined there were two root causes of this incident. They were:

- 1. "As per accepted practice, the employee was under or adjacent to the suspended load around the machine sole plate and was struck when the front breast roll lowering frame fell back causing injuries which proved fatal.*
- 2. When lifting the breast roll into position, the front side winch cable was not connected. When the breast roll was lifted to contact with the roll lock bracket and with the air motor driven to stall, the load exerted on the back side cable caused it to fail catastrophically. As the front cable was not connected, the roll and front breast lowering frame fell back. The subsequent breakage of the rear breast roll lowering frame was caused by the immediate stop as it hit the machine frame."*

Following the determination of the root causes a series of recommendations were made, with a view to preventing a re-occurrence or similar incident. A number of these recommendations will be valid across the pulp and paper industry.

(ACTUAL) RECOMMENDATIONS

When taking into account all the factors identified in the investigation, the following controls were recommended.

1. *That engineering and procedural changes must be made to the breast roll raising / lowering mechanism to reduce the risk of a similar occurrence.*

- a) Investigate the feasibility of eliminating the wire changing mechanism and replacing it with a pneumatic lift mechanism.
- b) An additional operating lever to be installed at the back of the machine to operate in series with the front lever
- c) The bearing holding clamp to be fitted with a pneumatic arm so operators no longer have to manually lift the arm from below
- d) A guard to be installed to prevent access to the area below the suspended load.
- e) A guard to be installed on the cables and air motor high speed drive coupling to prevent entanglement.
- f) The front operating lever to be relocated above the elevated walkway so that the operator can see the position of the roll when being raised.
- g) Work procedures should include a requirement to re-attach the cable and pin
- h) An air-operated limit switch and striker plate to be installed to prevent the swing arm contacting the roll lock bracket.
- i) Air pressure available to the gearbox be maintained at 415kpa (60 psi) to ensure the unit cannot exceed its Factor of Safety.
- j) Appropriate warning notice to be located adjacent to the air switch – “Do not allow the arm to come in contact with the stop while the motor is engaged”.
- k) The work procedure must be modified following engineering changes to the mechanism

2. *Where other machines utilise the wire cable and winch change mechanism to raise and lower the breast roll, a detailed review of the mechanism be conducted in light of the above recommendations and regulatory requirements*

3. *Define and conduct a review of all suspended load operations and ensure that employees do not operate under suspended loads, so far as is reasonably practicable.*

4. *Review all work procedures that are used for infrequent, operational tasks and consider the merits of utilising Job Safety Analysis for these tasks.*

5. *Review all existing work procedures against original machine manuals to ensure all warnings and safety instructions are included in the procedure.*

6. *Review on-the-job training methods including:*

- *supervision of trainee*
- *how progress through the training modules can be recorded and more effectively monitored.*

7. Review preventative maintenance of cables to ensure all cables are inspected and maintained according to the Australian Standard. The site should also ensure that, prior to lifting cables being used they are first inspected by a competent person as part of the start-up.

8. Conduct a review of the work order procedure to include more descriptive information and a feedback or archiving mechanism, so that previous work history is readily available.

9. Provide all control rooms with a basic trauma protection kit including disposable gloves, CPR masks and bio-waste bags.

Where similar lowering / raising mechanisms are utilised in the wider pulp and paper industry these recommendations should be considered for all existing and planned plant.

As a minimum legislative requirement all employers must undertake hazard identification and risk assessments on all plant prior to installation and commissioning; and after any significant changes to the plant.

