

SAFETY BULLETIN

DATE: NOVEMBER 2019

Conveyor pulley failures initiate fires

This safety bulletin provides safety advice for the NSW mining industry.

Issue

There have been recent incidents reported to the Regulator in which pulley failures have initiated fires in underground coal mines. This bulletin has been issued to address concerns about these incidents.

Incident 1:

A trunk belt stopped on a lanyard trip. When a worker arrived to inspect the conveyor, the tail pulley was found seven metres outbye of the installed location (refer to figure 1 below). Molten metal was found around the mount plates. A camera was monitoring the transfer. When the footage was reviewed, a glow could be seen for 50 seconds before the failure occurred, with flashes of increasing intensity. At the instant of failure, the structure violently shook (refer to figures 2 and 3). The pulley was fitted with temperature monitoring, which showed an increase from 33°C to 45°C before the failure. A previous vibration survey did not identify any issue. The carbon monoxide monitor detected a 1 ppm rise.

Figure 1 Failed pulley final location



Figure 2 and 3 Transfer before the failure and at time of failure. Flash on right hand side in figure 3



Incident 2:

A worker was completing an inspection when he identified a hot bearing in a tension pulley. The belt was stopped and the pulley was doused with water. An investigation identified the pulley had been changed three months prior, with the temperature probe changed at that time. During the change out, the faulty temperature probe was reinstalled, with the new probe left tied up nearby. There were also issues identified where the connections for the new probe had been terminated. Following the incident, the mine audited all other temperature probes to confirm they were operational and measuring correct temperatures.

Figure 3 Failed bearing



Concerns

In each incident, the temperature trip points were defined and set to alarm and stop the conveyor when the temperature exceeded 65°C or 85°C at the monitoring point. In incident 1, the failure occurred at a much lower temperature.

The incorrectly installed temperature probe was not measuring the temperature of the bearing housing. At no point was it identified that the bearing temperature was not rising or decaying when the conveyor was operating or stopped.

Recommendations

1. Review the trip points of condition monitoring devices. Consider the location of the device, the heat source and the effect of heat soak into other materials.
2. Periodically test and validate the operation of temperature monitoring devices against the actual temperatures of components when operating.
3. Confirm adequate commissioning checks are in place for condition monitoring devices.
4. Review the location of carbon monoxide monitors. Consider potential carbon monoxide sources and the local effects of the ventilation system.
5. Review the trigger action response plans (TARPs) for condition monitoring. Confirm that any contract condition monitoring providers are aware of the TARP triggers and associated response necessary.
6. Confirm that workers know how to respond to fires on conveyor systems.

NOTE: Please ensure all relevant people in your organisation receive a copy of this safety bulletin and are informed of its content and recommendations. This safety bulletin should be processed in a systematic manner through the mine's information and communication process. It should also be placed on the mine's common area, such as your notice board where appropriate.

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