



IMPALA PLATINUM LIMITED

Safety Flash No: 01/04

Impala Mineral Processes has experienced four safety incidents in the last four months involving diluted liquid xanthate and dithiophosphate. This safety flash describes the incidents, the learning points, and the remedial action taken.

What Happened

Incident 1 (29 Nov 2003)



This picture shows the MF2 Section xanthate dosing tank (green) and the dithiophosphate dosing tank (orange). These are closed tanks and the initial installation only had open overflow pipes. Diluted liquid xanthate (10%) was being transferred into the xanthate

dosing tank, which in turn was displacing fumes out through the overflow pipe. No safety permit had been requested or issued but a contractor boilermaker was using an angle grinder, approximately 7 metres away from the tanks. The sparks produced reached into the dosing tank bund area and ignited the fumes. The flames were quickly noticed and extinguished and there was no explosion. There were no injuries and no damage to equipment.

Incidents 2 (3 Feb 2004) and 4 (12 Mar 2004)



This picture shows the Merensky section collector dosing tanks. Whereas initially, the diluted liquid xanthate and dithiophosphate were dosed separately, incidents 2 and 4 occurred after the two collectors were being supplied pre-mixed in concentrated form. The mixed concentrated collector is still diluted on site to a solution containing 10% xanthate and 4.6% dithiophosphate.

In incident 2, no safety permit was requested or issued but a boilermaker was cutting off bolts from pipe flanges about 5 metres above the left hand dosing tank. Sparks were dropping onto and to the side of the tank. These tanks are not sealed and an explosion occurred. There were no injuries and only slight damage to the top of the tank.

In incident 4, a ventilation officer was standing on the middle tank cat ladder testing gas concentration using a Drager pump fitted with a hydrogen tube. This is despite the fact that in the instructions for use, it clearly states that hydrogen tubes should not be used in areas where there is explosion hazard. The manhole cover was open. The tube catalyst heated up sufficiently to ignite the fumes, which continued to burn for about 20 seconds. There was no explosion as such. The ventilation officer suffered a slight burn to his forearm; there was no damage to equipment.

Incident 3 (10 Mar 2004)



This picture shows the tank used to store diluted collector for spike dosing to the Merensky section flotation feed.

Given the other incidents, modifications to reduce the risk of fire and explosion had been planned for this area but not on the day this particular incident occurred. The contractor had been issued a safety permit to work in another area but he took it upon himself to rather work in this area. While cutting a hole through the walkway with an angle grinder fumes from the tank were ignited and an explosion occurred. At the time of the incident, the warning signs had not been positioned as shown. There were no injuries and no equipment damage.

Learning Points

- The hazardous nature of diluted liquid xanthate and mixed collector was not fully appreciated.
- Contractor training and control has been inadequate.
- Ventilation department training and knowledge was inadequate

Action List

- All collector dosing tanks will be closed. Overflows will have seal pots and vent through remote flame arrestors.
- Extraction systems will be installed on all dosing tanks. The extraction systems will be vented through remote flame arrestors.
- Access to both concentrated and diluted reagent storage areas will be restricted.
- Reclassification of the entire collector system will be done.
- Impala personnel will continuously supervise contractors working in collector storage areas. This is in addition to the normal procedures of risk assessment, site induction, and issue of safety permits.