

Workplace Health and Safety Bulletin



Pumpjack Maintenance Safety Precautions

Two recent deaths of oilfield maintenance workers bring to light issues common to many oilfield maintenance personnel. Practices followed when servicing wellsites with pumpjacks need to be reviewed by employers.

What happened

The first worker died while installing insulation on pumpjack piping. Investigators believe the unit was in operation at the time. The worker was crushed by the counterweight.

In the case of the second death, an oilfield pumpjack was having oil flow problems and was found to be cycling without any oil flow on a number of occasions. Here is what happened:

Three oilfield workers, one of them a field supervisor, attended to the wellsite location and were attempting to troubleshoot a problem with the pumpjack's flow. One of the actions taken was to release to atmosphere gas that had built up in the wellhead, commonly called "blowing down the well". The field supervisor and one worker released the wellhead gas into a plastic five gallon pail to catch any fluids during the draining process.

An unexpectedly high volume and rate of gas flow from the wellhead caused garbage debris to be blown out of the plastic pail and strewn around the pumpjack enclosure. The wellhead pressure was 60 psi and the workers were exposed to the wellhead gas. After the release, one worker proceeded to pick up the debris while the pumpjack was still operating. As the worker was picking up the debris, he was

struck in the head by one of the pumpjack's rotating counterweights, knocked to the ground and then crushed by the counterweight. The worker was not wearing any head protection.

Mistaken beliefs or misconceptions need to be dispelled

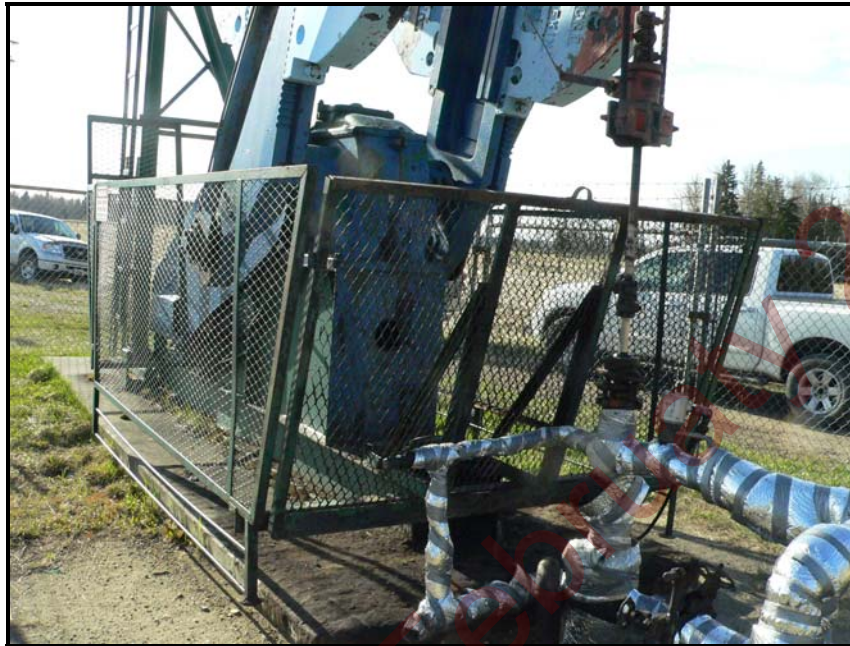
- Some workers believe that service work can be completed on operating pumpjacks because they rotate slowly and are not considered to be dangerous.
- Some companies believe that guarding the rotating counterweights on pumpjacks is not a high priority as the counterweights travel slowly and are not as dangerous to workers as higher speed equipment.
- Some workers believe that sweet wells are not as dangerous as sour wells.
- Some workers believe that venting sweet wellhead gas amongst workers is not dangerous. Wellhead gas poses fire and explosion hazards as well as having potential narcotic effects on workers exposed to it.

Occupational health and safety legislation applicable to circumstances similar to these incidents

- (1) Prior to starting a task, a hazard assessment must be completed. This encourages workers to be aware of the hazards and potential serious outcomes of not eliminating or controlling the hazards. The hazard assessment asks the question "What if?" [OHS Code Section 7]
- (2) Hazardous energy must be controlled by rendering equipment inoperative if it is being serviced, or if this is not possible, the employer must develop and implement procedures and controls that ensure the equipment can be serviced safely. [OHS Code Section 212]
- (3) Where there is a foreseeable danger of head injury, workers must use protective headwear. [OHS Code Section 234]

- (4) Safeguards must be provided where it is possible for a worker to come into contact with moving parts of machinery. [OHS Code Section 310]

Figure 1 – Example of pumpjack guarding



- (5) An employer must ensure that a worker's exposure to any substance listed in Schedule 1, Table 2 of the Occupational Health and Safety (OHS) Code is kept as low as reasonably practicable and does not exceed the substance's Occupational Exposure Limit (OEL). If no OEL is established, the employer must ensure that all reasonably practicable steps are taken to keep a worker's exposure to the harmful substance as low as reasonably practicable. [OHS Code Section 16]

Methane is such a substance. It is listed in Schedule 1, Table 2 with no set OEL. According to the Material Safety Data Sheet (MSDS) for methane, wellhead gas (natural gas) is approximately 87 percent methane along with some other components such as ethane, propane and butane. Methane is colourless and odourless, therefore difficult to recognize. Methane is highly flammable, can act as an asphyxiant and may also have a mild narcotic effect.


Any release of wellhead gas must be done in a manner that does not unnecessarily expose workers to this highly flammable product or that may also disorient a worker through its narcotic effect. An alternate method of removing wellhead gas when troubleshooting pumpjacks may have to be considered. Many facilities scavenge or conserve wellhead gas.


- (6) Work processes must not create fire and explosion hazards. Containers used for the transfer of flammable or combustible products must be grounded to control static electricity. The plastic pail used in the incident described above was not suitable for trying to capture wellhead fluids and was not grounded. Blowing the wellhead gas into the pail concentrated the flow towards the faces of the two workers completing the task and put them at risk. The operating pumpjack was a potential source of ignition of the flammable vapours being released. [OHS Code Section 165]
- (7) If a worker may be exposed to a harmful substance at a work site, the employer must establish procedures to minimize worker exposure, ensure workers are trained in the procedures and inform workers of the health hazards associated with the harmful substance. [OHS Regulation Section 15]


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