Welded flange failure on SMBS pump

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What happened?

A worker was standing next to a mono pump that pumped 30% sodium meta-bisulphite (SMBS) when a welded flange on the discharge failed. The worker was sprayed with SMBS but did not sustain any significant injury.

How did it happen?

After changing the duty and standby pump valves, the worker was in close proximity to the pump when it was started by the control room operator.

The discharge flange formed a crack that failed, spraying SMBS mist on the worker.

Why did it happen?

Investigation of the incident revealed a number of failings including:

- The pumps were not bolted or otherwise secured to reduce vibrations or other movement (Critical control)
- The original installation had threaded the pipe reducing the wall thickness
- The crack appeared to be in the heat affected zone from the weld
- No maintenance or checks of the pipe integrity had been conducted
- No consideration had been given to fatigue and vibration on the pump and infrastructure

Recommendations

The operator must provide workers a safe place to work. This should include ensuring:

- equipment is designed for the intended use in its intended environment
- maintenance monitoring is conducted at appropriate intervals, and should include static plant such as pipes
- equipment is properly secured and supported to reduce the risk of long term fatigue failures due to vibrations or other movement
- any safety devices such as pressure relief valves are tested periodically
- appropriate first aid and emergency facilities are available


Figure 1: SMBS pumps as installed


Figure 2: Cracked discharge flange - outside

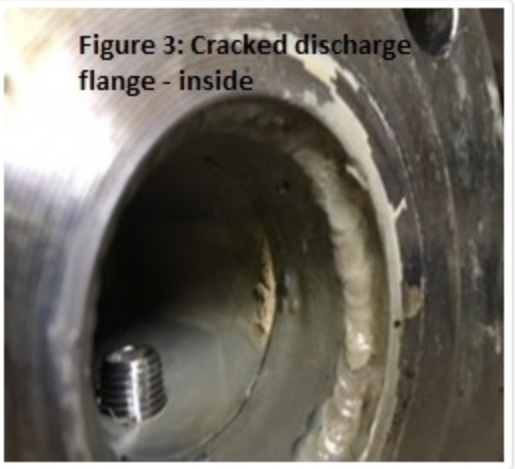
Figure 3: Cracked discharge flange - inside

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