

Case Study for STN 30 pumps @ Brewery



CDR Pumps UK Ltd recently supplied six STN 40 pumps. The well know Yorkshire brewery was in need of 2x 3 pumps booster sets suitable for circulating CIP fluids round hygienic areas of the brewing process.

CDR supplied the 6 units to be assembled onto two stainless steel bedplate with common suction and deliver pipe work and 3 pump control panel.

Each pump set was located in separate part of the brewery and integrated into the automated cleaning process.

Each STN Pump was expected to delivery 9000l/hr @ 2.0bar of Alfa Laval CIP 20 Fluid. @ 30oC. Pumps operated in a duty assist+ standby manner.

Cleaning-in-place (CIP) systems

Overview

Cleaning-in-place (CIP) systems are used extensively throughout the food and drink industry. They clean equipment automatically to a high standard. CIP systems typically start with a pre-rinse to remove solids, followed by a chemical wash with caustic and acid solutions, and finish with a rinse using a sterilising solution to remove the wash chemicals.

CIP systems offer fast, efficient and reliable cleaning of all types of process plant. Tanks, exceptionally large diameter pipes and large containers may be thoroughly cleaned using spray balls or rotating jet devices and this avoids the unnecessary and uneconomical filling of vessels with solution. It also removes the need for operators to climb into vessels to carry out manual scrubbing.

With CIP systems, water use and effluent generation can be minimised in a number of ways, including:

- Removing as much product as possible before the pre-rinse, eg by using a pigging system, to reduce water use for flushing out solids and residues. Chemical use and effluent concentration will also be

reduced. In addition: check that vessels, tanks and pipes have been drained as fully as possible; install collection trays or containers that can be removed before running the CIP cycle.

- Optimising the amount of water used in the pre-rinse by shutting off the water supply as soon as the solids have been flushed through. A pre-rinse controlled by a timer may use unnecessary amounts of water. If your process is consistent and reliable, timing devices can be set to provide the optimum rinse. Otherwise, consider visual inspection or use of turbidity meters.
- Adjusting CIP controls to ensure that the optimum amount of water is used. Individual CIP programmes should also be tailored to avoid excessive use of chemicals and energy.
- Using cleaning chemicals, eg foaming chemicals and gels, to reduce the amount of cleaning water required. Consult suppliers to assess the costs and benefits of such chemicals.

Recycling rinse water

CIP sets may be built or modified to include a recovered water tank where used water from final rinses is stored for subsequent use as a pre-rinse. The recovered water tank may also be used to supply water for other cleaning purposes.

If a disinfectant/sterilant cycle is used then this solution can also be recovered and re-used for pre-rinse purposes. However, it is not possible to use water containing hypochlorite as a pre-rinse if caustic is being used as the detergent because the two chemicals react. If peracetic acid is used as the disinfectant chemical instead, then this can be safely recovered for re-use.

Optimising CIP programmes

Often, when CIP sets are commissioned, the CIP programmes are not designed to minimise cleaning costs. In addition, the cycle times, temperatures and/or chemical concentrations used by the CIP set may be modified over time. In many cases, significant savings, maybe as high as 20%, can be achieved without compromising standards of cleanliness by improving CIP systems. This can be done by:

- using the CIP programme best suited for the size of plant and type of soiling;
- optimising the individual CIP programmes to ensure they provide the cleaning required without excessive use of water, chemicals or energy.

Often, the same CIP programme is used for vessels of different sizes and different types of soiling, resulting in increased water and chemical use. Normally, it is not practical to provide a separate CIP programme for every individual cleaning requirement. However, the major areas of waste can often be eliminated by modifying existing CIP programmes or by providing a wider variety of programmes.

The efficiency of a CIP system is a complex combination of temperature, chemical concentrations and cleaning times. The optimisation of cleaning programmes should only be carried out by qualified and experienced people.

Quick tips for CIP efficiency

- Clean tanks and other large containers using spray balls or rotating jets.
- Remove as much product as possible before pre-rinse.
- Shut off pre-rinse water as soon as solids have been flushed through.
- Tailor CIP programmes to optimise water use for specific cleaning tasks.
- Use cleaning foams and gels to reduce the amount of water needed.