

## Transferring Liquid by Pump

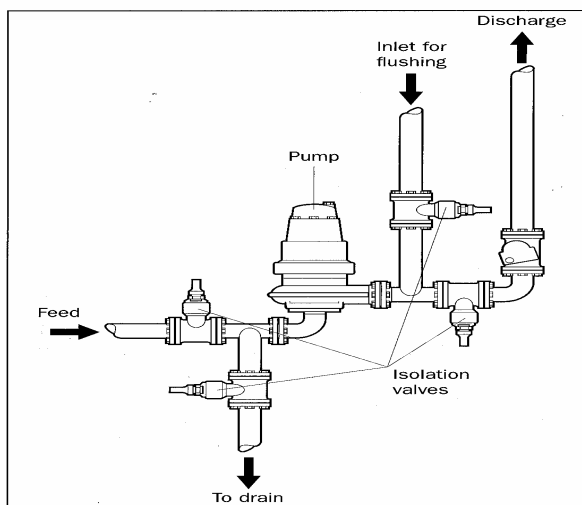
### SCOPE

- This control sheet is part of the ILO Chemical Control Toolkit and should be used when the toolkit identifies that a control approach 3 solution is needed. The sheet gives good practice advice on transferring medium and large quantities of liquids by pump and describes the key points you have to follow to reduce exposure to an adequate level. It is important that all the points are followed. Some chemicals are flammable or corrosive and your controls must be suitable for those hazards too. Look at the safety data sheet for more information. This sheet identifies the minimum standards you need to apply to protect your health. It should not be used to justify a lower standard of control than that which may be required for process control or control of other risks.

### ACCESS

- Keep unnecessary people away from the work area. Ensure that no one is working close by downwind.

### DESIGN AND EQUIPMENT



- Design the closed system to allow easy maintenance.
- Ensure that seals, gaskets and valve packings are compatible with the materials being handled and suitable for the conditions of use. E.g. will not creep or crack at high temperature.
- Ensure all pumps, pipes and couplings are to a suitable standard.

#### **Fixed pipeline**

- Minimise the number of branches and deadlegs.
- Ensure all pipelines are properly supported and protected from

damage.

- Ensure pipelines have sufficient flexibility to allow for thermal expansion.
- Provide slip plates or valves to isolate sections of pipe from plant.
- Provide arrangements for draining/flushing sections of pipe and for safe disposal of residues.
- Provide precautions against static discharges.
- Consider means of dealing with blockages, e.g. stream inlets or rodding eyes.

#### **Flexible piping**

- Use bolted clips, not screw clips such as jubilee clips.
- Consider the need for rapid isolation in the event of an emergency.

## **Pump**

- Protect the pump against overheating and overpressure, e.g. by the use of pressure relief valves.
- Provide arrangements for draining and flushing the pump and for safe disposal of residues.
- Make provision for the maintenance and replacement of the pump, e.g. by slip plates or isolation valves.

## **EXAMINATION, TESTING AND MAINTENANCE**

- Ensure all equipment used is maintained in good repair and efficient working order. Have the system thoroughly examined and tested at least once a year.
- Adopt a “permit-to-work” system for all maintenance work – see sheet S101.
- Document and follow any special procedures that are needed before the system is opened or entered, e.g. purging or washing.
- Don't enter any vessel until it is safe to do so. Check for hazardous or flammable substances and sufficient oxygen (between 19.5% and 22%). Note that entry or the work may give rise to a hazardous situation, e. g. disturbing sludge, welding may deplete oxygen.
- Check all the equipment once a week for signs of damage and repair when necessary.

## **CLEANING AND HOUSEKEEPING**

- Clean the work equipment and work area daily.
- Spills are the major cause of dust or vapour in the workplace. Clean up all spills immediately.

## **PERSONAL PROTECTIVE EQUIPMENT (PPE)**

- Chemicals in hazard group S can damage the skin or eyes, or enter the body through the skin and harm you. Sheets Sk100 and Sk101 give good advice on how to keep the materials off your skin.
- Check the material safety data sheet or ask your supplier to find out what personal protective equipment is needed.
- Respiratory protective equipment (RPE) should not be needed for routine tasks, but may be necessary for cleaning and maintenance activities and when dealing with spills.
- Be aware that some maintenance tasks may involve entry into confined spaces where supplied air RPE may be needed when there is not enough pure air to breathe.
- Look after your protective equipment. When not in use, keep it clean and store it in a clean, safe place.
- Keep your protective equipment clean and change it at recommended intervals or when it is damaged.

## **TRAINING AND SUPERVISION**

- Tell your workers about any harmful properties of the substances they are working with and why they must use the controls and PPE provided.
- Teach them to handle chemicals safely. Check controls are working and ensure that they know what to do if something goes wrong.
- Have a system to check that the precautions you have put in place are being followed.