

Maintenance Safety

(Guide lines which could also be adapted to areas of operator and cleaning maintenance activities)

The Risk Assessment

Does the work involve:

- moving machinery, live electrical equipment, corrosives, reactive, toxic or flammable chemicals or extremes of heat
- the use of lifting equipment
- entry into confined spaces
- the use of naked flames or other sources of ignition near to flammable gases, liquids, dust or combustible materials
- the use of temporary means of access
- Other work or normal production in progress at the same time?

These can be hazardous so!

ANTICIPATE the dangers; and use
SAFE SYSTEMS OF WORK

IF IN DOUBT KEEP OUT!

The maintenance person's checklist

BEFORE starting work on any task you should ask yourself the following questions:

1. What are the hazards?
2. Who is in charge of the job?
3. Has that person given authorisation or clearance for me to start work?
4. Have I been adequately trained for this job?
5. Do I need a permit to work?
6. Do I have the access equipment I need, e.g. ladders (if no other alternative) tower, scaffold etc?
7. Do I have the equipment I need for locking off valves, isolators etc?
8. Is there a special sequence that needs to be followed during the locking off procedure?
9. Do I have the protective clothing or equipment I need?
10. Are any checks required for the presence of toxic/flammable vapours, low oxygen levels, high temperature/humidities or noise levels?
11. Is there a time limit on how long I can work in this area?

IF IN DOUBT CHECK WITH YOUR SUPERVISOR

Systems of Work During Maintenance

Following the risk assessment process, it is necessary for management and supervision to decide on the appropriate safe system of work based on foreseeable risk.

METHODS OF CONTROL

One or more of the following procedures should be used to control the dangers that have been identified.

Locking-off

A locking-off procedure will be appropriate where an inadvertent or unexpected event could occur. Examples of these include:

- machinery being started up when people are working on or near it;
- discharge of hazardous fluids;
- energising of electrical equipment.

This procedure may take the form of locking-off an isolation switch in its open position, locking-off a clutch or drive by means of padlocks and/or callipers (a multiple lock system for use by more than one person), or by use of a trapped key exchange system. Other hazards may require the spading of pipes or physical disconnection.

Normally the same person who puts on a lock should be responsible for removing it, but there should be arrangements for handing over at the end of shifts and for removing locks that are inadvertently left in place by people who cannot immediately be traced. These should only be removed after a systematic investigation or assessment by a responsible person.

Permits-to-work

These are required if there is a risk of serious injury which cannot be adequately controlled by normal physical protection. There may be a single serious hazard or a combination of hazards (lesser or otherwise). Examples include:

- work on high voltage equipment
- entry into confined spaces,
- work on large plant items (which would include a major rebuild, installation or machine removal),
- hot work on plant or equipment where there is a fire or explosion hazard,
- working at heights (such as roof repair).

Employee should therefore be certain that the correct procedures have been followed by management, using an authorised person to monitor the whole process. A permit requires the authorised person to certify that the maintenance work may start and subsequently that the plant may be restarted. In most cases a locking-off procedure will be necessary before a permit can be issued.

To be effective it must be clearly written, and inform those responsible for supervising and undertaking the work what to do to make the situation safe before maintenance work actually starts. In addition, it should list the precautions needed for maintaining safety while the work is going on, and also the necessary procedures to be followed before the permit is cancelled and normal production is resumed.

The authorised person should monitor the work at appropriate intervals to ensure the permit is being adhered to. The permit also needs to be time bound so that it does not run over normal breaks, such as shift changes, when both the person undertaking the work and authorised issuer of the permit may no longer be involved.

Verbal systems of work

These should only be used for simple routing jobs which do not present a risk of serious injury and are within the oral skills and competence of the people carrying out the work. There may still need to be a written framework of general information, which should in any event be part of a properly written safety policy. Adequate training of staff and supervisors is essential to ensure that they have the necessary skills. This should include such refresher training as is assessed necessary.

Written systems of work

Where there is foreseeable risk of injury that can be controlled by having work carried out by a trained or experienced person using an established technique, then a written system of work may be appropriate. This should state who should do the work, what training, instruction and supervision is required, what equipment should be used, how the work should be done and what

precautions should be taken. A written safe system of work may apply to a one-off job or to routine work.

ACCESS

Maintenance work frequently involves reaching part of buildings or plant without fixed means of access. Careful thought needs to be given to how such access can be gained, especially if equipment and materials are also needed at the work location. Occasionallyadders may be suitable for some small-scale short term work but often consideration should be given to the use of tower scaffolds, purpose built scaffolds or mobile work platforms. All these means of access require appropriate control and/or construction by suitably qualified persons.

HANDLING OF LOADS

Ideally, buildings and plant will have been designed so that it is easy to move equipment around. Often however, maintenance work is carried out in cramped conditions in old buildings and handling of heavy loads is especially difficult. In all circumstances care should be taken to use only suitable lifting equipment which has been tested and certified. Lifting equipment should not be attached to parts of the machine or building unless the entire means of attachment has been assessed and certified as being safe by a competent person.

The maintenance personnel engaged in slinging or driving fork trucks should be given adequate training and should be subject to checks on their continuing competence. This may involve refresher training at appropriate intervals.

CONTRACTORS

It is beyond the scope of this document to give detailed advice on control of contractors. The relationship between occupiers and contractors is complex. Especially where a number of different contractors are working at the same time the occupier is likely to be the only person who can coordinate all the activity and ensure adequate information is exchanged between all parties and that this is passed on to the people who actually do the work. The work of contractors needs to be controlled and monitored, since they are likely to be unfamiliar with the premises, plant and the work processes on the site. It is essential that the contractors do not place themselves in danger or endanger the plant's own employees.

Somebody should be made responsible for ensuring that the contractor's employees are familiar with those parts of the site that are likely to be encountered. If necessary, the person should ensure the contractor's work is carried out in accordance with the plant's permit-to-work procedures.

Preliminary isolation will probably have to be carried out by plant personnel who are familiar with the site and equipment.

HUMAN FACTORS

Many maintenance jobs are non-routine and require initiative on the part of employees. Management should ensure that adequate training is given to everyone involved in this type of work and that both refresher training and training on new technology and working methods is given.

Whatever system is in use misunderstandings can occur when personnel change at the end of shifts. The system should be set up so that everyone is adequately briefed about the work in hand and the existing precautions.

It is not possible to provide a comprehensive definition of the qualities and qualifications appropriate to an authorised person. However, employers are advised to choose someone who:

- a) knows enough about the premises, plant and processes to be able to assess the implications of the work being carried out for the safety of the workers (different types of work may need different personnel, e.g. electrical work or work in confined spaces and there may be occasions where the work involves more than one authorised person), is able to work through a team on a major project and will liaise sufficiently to ensure all aspects of safety are covered;

- b) has sufficient authority within the organisation to specify the precautions which are needed and to ensure that the procedures are followed. The level of authority may need to vary depending on the scale of the work being carried out. However, although responsibility should not be given to people who do not have sufficient authority, it should not be placed with people who do not have adequate detailed knowledge of the plant and/or are not readily available.

MONITORING AND REVIEW

Whatever system of work is issued, management should periodically monitor maintenance work to ensure that:

- a) the laid down procedures are being followed and;
- b) the level of precautions is appropriate for the risks involved.

Procedures need to be reviewed in the light of experience or to accommodate changes in plant or any new or different hazards which are introduced to the site. In some workplaces, people who have recently carried out work in accordance with a permit-to-work system have the opportunity to suggest improvements or rewording on a blank sheet attached to the permit.