

## **INFORMATION FOR MOBILE PLANT AND EQUIPMENT OPERATOR TRAINING**

*This WISH information document is aimed at health and safety improvements in the waste management industry. The Health and Safety Executive provided support to WISH in producing this guidance. This guidance may go further than the minimum you need to do to comply with the law with regard to health and safety. This document sits under WASTE 21 'Health and safety training in waste management and recycling' and provides specific information on mobile plant and equipment training.*

### **Introduction and scope**

The aim of this document is to provide practical advice and information on best practice for the provision and management of mobile plant and equipment (such as loading shovels, cranes, forklifts, telehandlers and similar) operator training courses and competence development. As a minimum requirement, training should include theoretical components (underpinning knowledge), practical components (practical training) and specific job training.

This document has been produced to improve the efficiency and effectiveness of training delivery. The advice contained within this document is not a mandatory legal requirement but rather represents a pragmatic benchmark developed and administered by industry. Consequently, it should be read in conjunction with current legislation, HSE (Health and Safety Executive) approved codes of practices, and other recognised industry standards.

This information document covers all categories of mobile plant and equipment used to move, lift, and carry any waste or other commodity handled during excavation, extraction, stockpiling, compaction, or any other machine operation. Commodities could include, general waste, recycled and recovered wastes, specialised wastes, waste metals, composts etc.

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In addition to this information document and its appendices, two reference documents have been produced to support the advice given:

- **WISH REF 08 Example daily mobile plant checklist**
- **WISH REF 09 Example training record**

Readers are advised to also view these documents, both of which are available free of charge on the WISH website.

## 1. Current legislation

Current legislation states that training is a prerequisite requirement for anyone operating mobile plant and equipment, including within the waste and related sectors. This requirement is contained within the Health & Safety at work act (HASWA 1974) and supplemented by various regulations. Such as:

- Management of Health & Safety at Work Regulations 1999
- The Provision and Use of Work Equipment Regulations (PUWER) 1998
- The Lifting Operations and Lifting Equipment Regulations (LOLER) 1998

## 2. Organisational duties

It is the duty of every employer to ensure, so far as reasonably practicable, the health and safety and welfare at work of their employees (HASWA 1974). This applies to the provision of equipment and systems of work that are safe and without risk to health and safety. In particular the duties of the employer with regards to mobile plant include:

- Ensuring that all machinery, equipment, and appliances used are safe
- Ensuring that the handling transportation and storage of materials are safe
- Providing information, instruction, training, and supervision to ensure the health safety and welfare of employees at work, and anyone else effected by any acts or omissions
- Employers also have a duty with regards to the health and safety of persons who are not employees, such as the self-employed or contractors. This duty extends to members of the public and employers must ensure that the public are not exposed to health and safety risks regards operators of mobile plant

Employers should:

- Identify the competencies needed by the operator and determine the aims, objectives and extent of the training needed to maintain competence
- Recognise that competence is not a 'once in a lifetime' achievement and that periodic revision is required to keep abreast of technological and legal development.
- Provide necessary training in a timely, regular, and systematic manner
- Assess individuals or groups after training to verify the acquisition of the relevant knowledge skills needed to achieve competence
- Ensure training is suitable and sufficient for the organisational needs

- Maintain detailed training and competency records
- Ensure that training is adequately covered in the organisation health and safety policy and that policy is reviewed appropriately

## 3. Obligation to provide mobile plant basic training

Except for those training under close and adequate supervision (for example those within sight, control, and constant communication) employers must not allow anyone to operate any mobile plant and equipment without satisfactory completion of basic training and testing, that is mapped to industry standards. This is particularly important for young persons and newly certificated operators, including those undertaking vocational training as part of a training scheme operated by outside agencies, who will require additional supervision.

## 4. Training and competence

The use of untrained or inadequately trained operators is a major cause of accidents. Even if an incident does not cause a fatality or injury, it may damage the equipment, materials or completed work (near misses), thereby incurring unnecessary financial loss. Training is the indispensable basis for the achievement of competence.

**Training** – for the purpose of this guidance defined as: *The act or process by which an operator learns, acquires, and is tested upon operational ability, skill and experience, relevant industry health and safety knowledge and hazard awareness to standards set by industry.*

Upon completion of the training, the operator should have acquired sufficient and relevant underpinning knowledge and practical skills to safely commence specific job training. The requirement for training applies to all plant and equipment operators including those who use it on an occasional basis (e.g. supervisors). Certificates or operator registration cards showing documentary evidence of training should be current and relevant to the specific type of plant or equipment operated. Being the recipient of training does **NOT** mean that the operator is competent.

**Competence** - for the purpose of this guidance defined as: *A standard at which an operator is certified to operate plant and/or equipment and has acquired sufficient job specific knowledge and experience of that specific item, (including the use of safety features, attachments, machine controls, and other electrical or mechanical features) operating in that specific environment in order for the machine to be operated safely and efficiently.*

The achievement of job competence involves a combination of individual ability and capacity augmented with rigorous and appropriate training and the accumulation of relevant operational experience. Operators should be competent in the safe operation of plant and equipment under all operational conditions and environments.

## 5. Selection of operators

Management of Health and Safety at Work Regulations require that employers shall, in entrusting tasks to their employees, consider their capabilities with regards to health and safety. Operators should be reasonably fit both physically and mentally to safely control and operate mobile plant and equipment.

Operators should have:

- Sufficient movement of limbs and co-ordination to enable proper control of mobile plant and equipment
- A level of vision enabling judgement of space and distance with normal peripheral vision. If glasses or contact lenses are necessary, they must be used at all times when operating plant and equipment
- An ability to hear instructions and audible warning signals, for operators with an audible disability there must be reasonable control measures put in place when operating plant and equipment.

Anyone found to be under the influence of, or whose ability is impaired by, alcohol, drugs/substances or prescribed drugs should not be allowed to operate plant and equipment.

## 6. Young persons

Young persons (16 -18 years) are not necessarily prohibited from operating mobile plant and equipment, but in selection assessment should take particular account of:

- Inexperience, lack of risk awareness and immaturity
- The need to provide close and continuous supervision by a competent person
- The nature, degree, and duration of exposure to physical risk, extreme cold, heat, noise, vibration, or biological and chemical agents

- The specific types and size of mobile plant and equipment that may be operated together with any mechanical/electrical features or limitation of use (for example lifting capacity)
- The size nature, layout of a site, specific site hazards and site working procedures

During mobile plant and equipment operation, it is advisable that young/inexperienced operators are mentored by an experienced operator and manager who are both competent and can provide guidance and tutoring on the safe and efficient use of the machine.

## 7. Newly certificated operators

Statistics reveal that the probability of accidents occurring is higher during the first two weeks of an operator's training certification. Special care and consideration should be taken to ensure that the newly certificated operator is closely monitored and supervised by competent supervisors, managers and or other suitable persons. This may include:

- Regular checks and assessments of the operator's operational performance by competent persons within the employer's organisation
- Periodic spot checks conducted by a third party (for example, an external training provider who is certified as competent)
- Identification signage identifying a newly trained operator

## 8. Assessment of competence

Assessment of competence requires the observation, testing and consideration of many factors. Fundamentally, competence involves the ability to complete specified work tasks safely, reliably, and efficiently with proper and economical use of resources. Competence should be assessed against recognised industry standards wherever possible and recorded.

To formally recognise competence, an S/NVQ qualification may be awarded. However, the achievement of S/NVQ indicates assessed practice and underpinning knowledge to a given criteria. It does not demonstrate the currency of competence, nor does it indicate current physical or mental ability to sustain competence.

## 9. Responsibilities of operators

Operators should be aware of their legal responsibilities, own duties, and any organisational and site-specific working procedures. Site traffic routes must be observed, and all hazards noted. Any working outside normal site boundaries and/or on public roads or public traffic routes should be conducted with due regard to the safety of the public, fellow workers, and off-site traffic. Operators must ensure that before taking mobile plant onto public roads, they are in possession of a current driving licence and covered by a current road fund licence and insurance for the mobile plant equipment. Details on the machine specification can be found in the machine's operations and service manual.

## 10. Management and organisation of training

The ability of the operator to be able to perform specific tasks competently requires adequate time, resources (including the correct tools and equipment), and commitment from the employer. There are six fundamental stages that underpin operator competency (see appendix 1 for an overview of the process).

### Site based induction training

The site induction training process informs the operator of their responsibilities within the organisation, to themselves, and to others, and includes:

- Site rules, specific hazards, layout of site, location of facilities such as welfare, and medical, emergency procedures and any other material relevant to site operations
- Training and competence development plan
- A description of the plant and equipment item(s) to be operated and the activities conducted

### Basic training

Basic training must cover fully the skills and knowledge required for the safe operation of the type of mobile plant and equipment which the trainee will use. This will include particular hazards (e.g. underground and overhead services on site), maximum capacities and limitations of mobile plant equipment used. Similarly, an in-depth knowledge of load manipulation, stacking, unstacking, loading, or dumping procedures should be acquired.

Basic training should consist of two elements, theoretical and practical training.

## Theoretical training

The purpose of 'taught' mobile plant equipment theory is to instil operators with relevant information that will ensure safe and productive operation. Operators should be aware of any potential hazardous situations, including fires, their potential consequences and how to avoid them. Theoretical operator training should concentrate on important underpinning knowledge such as stability characteristics, maintenance and safety equipment, guards, fixed fire suppression systems and alarms fitted and any other relevant technical aspects.

## Practical Training

The practical element of a training course should consist of a combination of observation and supervised 'hands-on' operation. i.e. the trainee operator will receive a demonstration of basic machine manoeuvres and maintenance performed by a competent person (trainer) prior to acquiring practical experience. The practice area should be as level and clean as possible without interruptions as to avoid any unnecessary danger. This will allow the operator to acquire operational confidence and basic operating skills. Thereafter, the training should aim to simulate a more realistic work environment whereby the operator is gradually introduced to various site conditions of increasing difficulty and alerted to potentially hazardous operational conditions. At this stage, the trainee can begin learning more complicated manoeuvres and techniques.

Each type of mobile plant and equipment may have different operating characteristics, limitations, and other unique features, including controls, operational techniques and procedures, machine stability and capacity. Therefore, the training program should be based upon the type of mobile plant and equipment that the trainee would be authorised to operate in the workplace, including the specific type of attachments that will be used.

A collaborative approach should be taken to meet the needs of the individual trainee and the company. Practical training should be flexible, without compromising the learning outcomes of the trainees ensuring that each trainee is given sufficient practical experience under close supervision, with adequate time must be allowed for the trainees to absorb and practice the instruction given.

The program should ensure that at each stage the operator is proficient, and the course objectives have been met. The basic components of a typical training course for basic training is outlined in appendix 2.

## Specific Job Training

Specific job training is a further essential element of training. It will normally follow the completion of basic training but may be combined or integrated with it. It will be tailored to the employer's particular needs and include, where appropriate:

- Familiarisation with pedestrian and vehicle traffic routes in order to ensure, as far as reasonably practical, that risks to the health and welfare of operators and pedestrians are minimised. The operator will also have to be aware of floor surfaces and/or ground conditions where the vehicle will be operated, since these can influence machine operations
- The composition of loads and determination of load stability (for vehicles that carry loads)
- As relevant, specific instructions and safe techniques for specific waste related tasks, such as pushing-up of wastes, loading bulk lorries etc
- Operating technique, systems and procedures when working in classified hazardous locations, that exist or may exist in the workplace
- Operating the vehicle in closed 'unventilated' environments, trenches, or confined spaces where insufficient ventilation and/or poor vehicle maintenance could cause a build-up of noxious exhaust fumes

This specific extra training can be informed by site risk assessment

## Conversion Training

An experienced operator will require additional training when:

- New tasks are undertaken such as the use of new attachments (buckets, grabs, cutting shears and so forth)
- There is a change in method of work environment or the introduction of or exposure to, new risks, for example wheeled loader loading vehicles will require extra training if basic training did not cover this due to operational requirements
- New equipment or technology (on board health and safety equipment, rear view cameras etc.) is used and especially where there are changes in control systems, layout, type or size of plant and equipment)

## 11. Selection of instructors and training providers

Instructors must have undergone appropriate training in instructional techniques and skills assessment. Instructors must only train on the categories of mobile plant and equipment including attachments for which they have been trained, tested with valid certification, and shown to be competent. Instructors also need sufficient and appropriate knowledge of the industry and the environment in which their trainees will be expected to operate.

## 12. Assessing and testing trainees (basic and conversion training)

The instructor should assess the progress of the trainees continuously to ensure the required standards are achieved at each stage (and recorded). Trainees must be tested on completion of the course to ensure that objectives have been met. Records of assessment conducted should be available for the purpose of auditing. The records should be signed by the trainee and the instructor and marked pass or fail. Upon completion of the training program, the instructor must finally evaluate the trainee by knowledge test and practical ability.

## 13. Testing knowledge

To determine whether the operator has retained adequate knowledge pertaining to the machine and its operational environments, a formal, verbal, or written test is required. A significant proportion of the questions (at least 25%) should be mobile plant or equipment specific, that is appropriate to the mobile plant or equipment item to be operated. These may include topics concerning fuel storage, mounting, and dismounting the machine and so on. The remainder of the questions will be on more general topics and are usually presented in a multiple-choice format. For example, questions on who is responsible for managing health and safety on site or conducting risk assessments are typical.

The test should be delivered through an appropriate medium, dependent upon the individual trainee. Some operators may be more comfortable with a written test rather than a computer-based test. Where operators lack basic written skills or feel intimidated by these methods, a verbal examination may be more appropriate. Whatever the means of testing, the standard of questions must be high enough to ensure a safe, productive working environment and should be relevant to the operators' daily tasks and duties.

## 14. Practical testing ability

The operational ability obtained by the operator throughout the practical element of training received must also be tested. A predetermined benchmark standard for each item of practical training is retained by the tester and used to measure the operator's actual performance against during a practical test. A summary typical list of the components of a practical test of basic skills is given as appendix 3.

## 15. Refresher training and periodic evaluation

Skills which are not used regularly, tend to fade and those who occasionally operate mobile plant and equipment may need more frequent refresher training and/or supervision. Refresher training will therefore commence as a direct result of periodic evaluation, normally within periods of no more than 5 years. Management should be alert to circumstances and incidents that indicate the need for refresher training.

## 16. Training venue, area, and facilities

Training venues are required to ensure the health and safety of trainees, instructors, and others (including pedestrians and the general public). It is the responsibility of those in charge of training to require this; it is the responsibility of management to ensure this.

Wherever possible the mobile plant or equipment used should be of the same type and model that the trainees will be expected to operate post training, if this is not the case equipment familiarisation may be considered. Mobile plant and equipment must be maintained in good working condition, conform to all legal requirements and be suitable for the purpose for which it has been designed, equipment specifically hired for training courses must be checked and inspected by a competent person at the time of delivery. Trainees should be provided with and use appropriate personal protective equipment.

A suitable manoeuvring area and transport route (this should be separate to the pedestrian route) should be provided and cordoned or marked off. Whilst training is in progress this area should be restricted to the instructor and the trainee(s) only. The area should have been checked for underground or overhead services and proof of such should be readily available. The area should simulate as closely as possible, the actual operational conditions likely to be encountered by the trainees in the workplace.

Accommodation provided for the theory lessons may be safe and free of interruptions, warm and well lit. Minimum resources for presentation may include items such as flip charts, overhead projector/video computer and possibly scaled models or detailed pictures of the plant or equipment. Health, safety, and welfare arrangements must also conform to legal requirements.

## 17. Record keeping

At each stage of the plant operator training process, and thereafter, a full and complete record must be kept ensuring that documentary evidence is available to determine the skills and competencies of the operator. As a minimum requirement, evidence may include:

- A certificate(s) of basic training received including machine and attachment
- A certificate(s) of conversion training received
- A certificate(s) of health and safety course attendance
- A certificate(s) of a health and safety test(s)
- A copy of any periodic monitoring
- Fit to operate medical certificate

A training achievement matrix provides a readily available 'quick reference' and a useful form for recording an operator's progress at any stage of the operators training process. This form provides examples of key performance indicators that measure whether the operator has first received adequate training and a plan to full competence.

## Disclaimer and WISH

This information document has been prepared by health and safety practitioners to assist health and safety improvements in the waste management industry. It is endorsed by the WISH (Waste Industry Safety and Health) Forum. This information document is not formal guidance and represents good practice, which typically goes beyond the strict requirements of health and safety law.

Nothing in this information document constitutes legal or other professional advice and no warranty is given, nor liability accepted (to the fullest extent permitted under law) for any loss or damage suffered or incurred because of reliance on this document. WISH accepts no liability (to the fullest extent permitted under law) for any act or omission of any persons using this document.

This information document is not a substitute for duty holder and/or professional safety advisor's judgment. Notwithstanding the good practice in this document, duty holders are responsible for ascertaining the sufficiency and adequacy of their internal and independent procedures for verifying and evaluating their organisation's compliance with safety law.

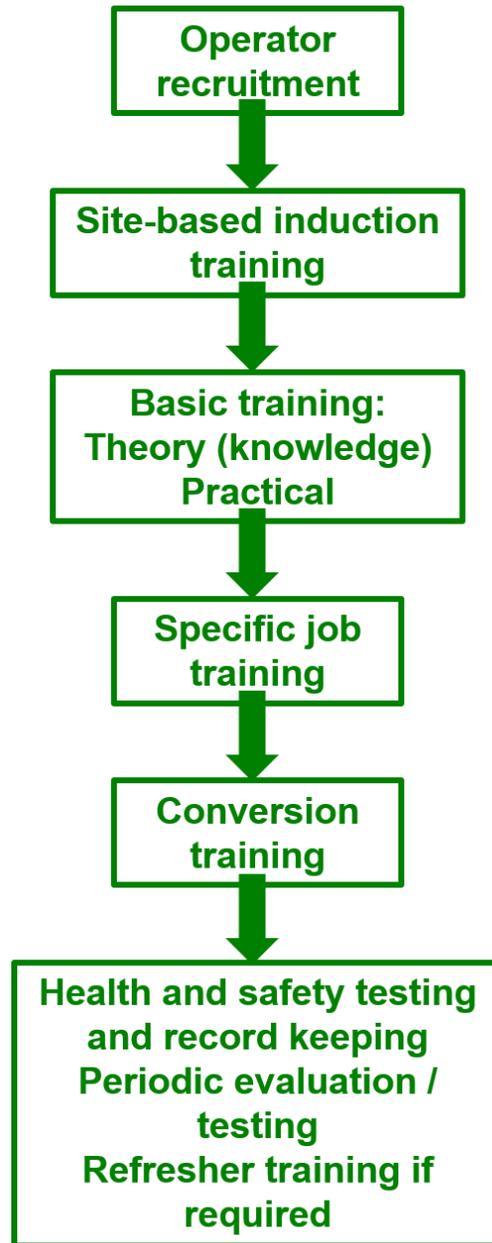
The Waste Industry Safety and Health (WISH) Forum exists to communicate and consult with key stakeholders, including local and national government bodies, equipment manufacturers, trade associations, professional associations, and trade unions. The aim of WISH is to identify, devise and promote activities to improve industry health and safety performance.

## Useful links and further reading

WISH website: [www.wishforum.org.uk](http://www.wishforum.org.uk)

HSE waste and recycling webpages: [www.hse.gov.uk/waste/index.htm](http://www.hse.gov.uk/waste/index.htm)

## Appendix 1. Overview of mobile plant and equipment operator training process



## Appendix 2. Objectives to consider for inclusion in a basic training course

On completion of training, the trainee should, in relation to the relevant category of plant and equipment be able to:

1. State the reasons for operator training, the risks associated with plant and equipment operations and the causes of accidents, such as poor vision from the cab, and including effects from mobile plant operation, such as damage to push walls and other structures
2. State the responsibilities of operators to themselves and others, including their duties under the Health and Safety at Work act 1974, LOLER 1998 & PUWER 1998 (although over-burdening trainees with legal requirements can be counter-productive)
3. Locate and Identify the basic construction and main components of the mobile plant machine, stating its principle of operation and explain their functions
4. Identify the correct use and maintenance of PPE, appropriate for the task
5. Carry out Pre-Use checks and maintenance tasks to manufacturers and legislative guidelines.
6. Safely mount and dismount mobile plant equipment
7. Locate and state the purpose and method of use of all controls and instruments and explain their functions
8. Where applicable state the purpose and demonstrate the procedures for the use of safety devices including reversing vehicle warning systems, stabilisers, inclinometers, and load indicators, body up indicators, proximity warning systems, fire suppression systems etc. if fitted
9. Start and stop the power unit safely, and configure the equipment for travel and manoeuvre it safely across varying terrain in open and confined areas
10. Identify various forms of loads or materials the equipment will be capable of Extracting, Excavating, Transporting or Lifting
11. State factors that affect machine stability e.g. load type, turning, especially related to speed and sharpness of turn, machine's capacity, smoothness of operation and ground conditions
12. Carry out tasks appropriate for type of mobile plant equipment
13. Follow correct procedures when loading and unloading vehicles or structures designed to receive loads
14. Make visual checks to ascertain the safety, soundness and rating of structures designed to receive loads, and what to do when damage is detected including and up to stopping work
15. Identify, attach, check, and detach attachments appropriate to equipment which may be used with the machine
16. State the actions to be taken in an emergency while in control of a machine, for example, action to be taken in the event of a tip over, fire in the vehicle or outside
17. Park the machine, follow correct procedures to secure and isolate equipment including a post use check
18. State why it is essential to have vehicle keys custody arrangements

## Appendix 3. Typical summary test of operator skills

Testing could include the following, as appropriate:

1. Operation of machine within the safety limits defined by the manufacturer
2. Carrying out a pre-use check on the machine is to be used
3. Correct mounting and dismounting procedure and correct operating position
4. Correct use of controls
5. Movement of the machine with attachments in the correct travel position, laden and unladen
6. Manoeuvring a loaded machine forward and in reverse in a narrowly confined area
7. Handling loads or material of a type for which the machine is designed to handle
8. Where appropriate extract or excavate material from pre-designed working area
9. Where appropriate load production machinery or equipment
10. Where appropriate loading/unloading of mobile plant equipment
11. Where appropriate carryout the task the machine is designed/employed to do
12. Correct parking of the machine