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Earth-moving machinery — Operator training — Content and methods

Engins de terrassement — Formation du conducteur — Contenu et méthodes

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 7130 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 3, *Machine characteristics, electrical and electronic systems, operation and maintenance*.

This second edition cancels and replaces the first edition (ISO 7130:1981), which has been technically revised.

Earth-moving machinery — Operator training — Content and methods

1 Scope

This International Standard provides a basis for content and methods used for operator training for earth-moving machinery as defined in ISO 6165. The training in turn provides the basis for developing operators of earth-moving machinery who are knowledgeable and understand the manufacturer's instructions for safe and proper operation and routine maintenance. It establishes criteria for evaluating the competency of a person who operates and could perform routine maintenance of earth-moving machinery, but does not specify any procedure for proficiency testing or assessment of the operator's competence of operating and maintaining earth-moving machinery. It is not intended to substitute for national or regional requirements or regulations related to operator training.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6165, *Earth-moving machinery — Basic types — Identification and terms and definitions*

ISO 6405-1, *Earth-moving machinery — Symbols for operator controls and other displays — Part 1: Common symbols*

ISO 6405-2, *Earth-moving machinery — Symbols for operator controls and other displays — Part 2: Specific symbols for machines, equipment and accessories*

ISO 9244, *Earth-moving machinery — Machine safety labels — General principles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6165 and the following apply.

3.1
operator
person who operates and could perform routine maintenance of earth-moving machinery

Note 1 to entry: "Routine" includes items as defined by the manufacturer, e.g. tyre pressure, fluid levels.

3.2
simulator
system that imitates the experience of operating an earth-moving machine

3.3
trainee
person receiving training

3.4
trainer
person qualified to instruct a trainee to properly operate and perform routine maintenance of earth-moving machinery

3.5
training
process of acquiring knowledge and developing skills and competency to operate and perform routine maintenance of earth-moving machinery

3.6
work site
place where earth-moving machines are operated or where routine maintenance is performed

4 Requirements

4.1 General

The purpose of operator training is to impart to the trainee the knowledge and skills necessary for proper operation and routine maintenance of earth-moving machinery according to the manufacturer's instructions. If an operator is required to be qualified, the training also needs to be made for the purpose of covering qualification.

The content and duration of operator training will depend upon the machine family, application, and complexity of the individual machine and its attachment, if applicable, and the initial level of trainee knowledge, skills, and experience.

NOTE Refresher training courses provide updates for an operator to learn about technical advancement and innovation applicable to the machine or may be necessary to comply with other national or regional requirements.

4.2 Criteria

The following is based on the information and instructions provided by the manufacturer in the operator's manual according to ISO 6750[1].

A trained operator shall:

— understand and apply proper safety precautions when operating or performing routine maintenance;

— understand and apply safe and proper machine operation, including applicable approved attachments, for its intended use including factors involved in maximizing machine productivity;

— understand and apply the information shown in instruments, machine safety labels, and operator control and display symbols in accordance with ISO 6405-1, ISO 6405-2 and ISO 9244;

— understand technical data, such as mass, length, height, width, volume, ground pressure and speed;

— understand and apply the manufacturer's instructions for proper use of the access systems;

— understand and remain within the limits of machine rated capacity, capability and stability, including related information such as load charts;

— understand and demonstrate the ability to

  — perform machine inspections (e.g. leakage, damage, cracks, condition of safety devices) and routine maintenance as recommended by the manufacturer,

  — follow instructions provided by the manufacturer for maintaining lubrication and fluid levels in the machine, and

1) ISO 6750, *Earth-moving machinery — Operator's manual — Content and format*

  - use common maintenance safety devices (e.g. articulation locks, support devices, wheel chocks) and adjustment tools;
- understand and apply the manufacturer's instructions and precautions for starting, travelling with, and stopping the machine, including the use of operator restraints, if so equipped,
- understand and apply the manufacturer's instructions and precautions for installing and removing approved attachments to the machine, including attachment control systems, where applicable,
- understand and apply the manufacturer's instructions and precautions for
  - lifting the machine,
  - towing the machine,
  - transporting the machine including the proper method for tying down the machine, and
  - moving the machine on public roads;
- understand the potential risks associated with the worksite:
  - ground contact pressure capability;
  - ground stability;
  - ground slope and traction conditions;
  - general ground characteristics (e.g. rocks, underground utilities, underground cavities);
  - other conditions on the work site (e.g. overhead utilities, workers and bystanders, other machines, obstacles, potential areas with risk of falling objects);
  - lighting, visibility, and weather conditions;
- understand the potential risks associated with specific applications requiring the use of additional accessories (e.g. cab enclosures, guards) to mitigate these risks.

NOTE Local or regional requirements and regulations may be applicable.

5 Trainers

5.1 General

The trainer assists the trainee to learn, understand, and acquire the knowledge, skills and competency to operate earth-moving machinery. Qualifications, resources and methods are listed below and could be adapted to accommodate regional or local requirements.

5.2 Qualifications

The trainer shall

a) be proficient in communicating the subject matter with a positive attitude,

b) be competent in operating and maintaining the machine,

c) be knowledgeable of manufacturer's operating and maintenance instructions, and

d) understand the machine and approved attachments, if applicable, and their intended operation.

5.3 Resources

Information available for trainers includes

a) standards,

b) regulations,

c) manufacturer's operator instructions and/or instructional programs, (e.g. training courses, video), and

d) skilled operators knowledgeable of the manufacturer's instructions for proper operation and routine maintenance.

5.4 Facility and training methods

Operator training may be provided either at a training facility or on a suitable operational work site.

The training shall be suitably balanced between technical information and operation of the machine in work site conditions or through the use of other means.

Training may include the use of facilities and training methods such as

a) classroom instruction,

b) instructive media (e.g. video or hand-held media),

c) interactive methods (e.g. computer, microprocessor, or on the machine),

d) machine simulator,

e) machine operation guided by the instructor, and

f) verification exercise (e.g. test or discussion).

6 Documentation of training activity

Upon successful completion of training, a certificate may be issued. Where appropriate, details of the training could be recorded in an operator's training record. The following are typical items to be included in the training record:

— trainee's name;

— contents of training course and applicable machine(s) and approved attachments;

— successful completion date;

— trainer's name and signature;

— name of training organization;

— location where training was conducted.

The training organization shall maintain documentation for participants who fail to demonstrate their competency requirements.

Optional documentation may record additional training and machine operation experience.