Lifting Devices Standard:
Inspection, Maintenance and Operation

Lifting Devices (see definition below) are used to minimize the hazards associated with materials handling operations; some examples include cranes, hoists, lift trucks, scissor lifts, lift tables and forklifts. The loads handled by these devices tend to be heavy, large and/or awkward and therefore precautions should be taken. These devices must be operated, maintained and regularly inspected by competent (see definition below) individuals only. This standard is based on the Regulation for Industrial Establishments (Regulation 851) made under the Occupational Health and Safety Act (OHSA) of Ontario.

SCOPE:
This standard applies to any Faculty/Department at the University of Toronto where a lifting device is operated by a worker.

Note: In this standard, "worker" includes faculty, staff, students and visitors.

DEFINITIONS:
"Competent Person" means a person who,

(a) is qualified because of knowledge, training and experience to organize the work and its performance;
(b) is familiar with OHSA and the regulations that apply to the work; and
(c) has knowledge of any potential or actual danger to health or safety in the workplace.

"Lifting Device" means a device that is used to raise or lower any material or object and includes its rails and other supports but does not include a device to which the *Elevating Devices Act* applies.

RESPONSIBILITIES:
Principal investigators, managers, supervisors and all others in authority shall:

- ensure that all lifting devices are inspected by a competent person before first use and then according to the frequency recommended by the device's manufacturer or at least annually by an external 3rd party service provider;
- ensure that all lifting devices are inspected by employees before use;
- develop and implement operating and maintenance procedures to address hazards that are specific to the workplace and the lifting device being used;
- ensure that only a competent person operates a lifting device;
- ensure that the maximum load capacity is clearly marked on the device; and
- keep records of inspections/maintenance of all lifting devices and training of workers.

Operators of Lifting Devices must:

- be competent and operate all lifting devices in such a way that no person is endangered by the load or device;
- not load the lifting device beyond the maximum rated load capacity, which must be plainly marked on the device;
- perform a visual and pre-operational inspection of the lifting device before use;
- report any defects/malfunctions in the lifting device of which they are aware;
- not permit passengers on lifting devices except when a suitable platform is used.

LIFTING DEVICES:
The handling of heavy loads is often a necessary component of the work conducted within many Faculties/Departments at the University of Toronto. Typically, lifting devices are used to handle these loads. There are many different types of lifting devices available; selection of the most appropriate one depends

on factors such as the characteristics of the load, where the load needs to be moved, the general work environment and the training and skills of the operator(s).
The loads handled by these devices tend to be heavy, large and/or awkward and therefore there are inherent safety concerns associated with lifting devices. The potential for serious injury and/or property damage underscores the need for appropriate operator training and knowledge of specific procedures for the safe use of lifting devices.

General Requirements for Lifting Devices

Specifications
Under Section 51 of Ontario, Reg. 851 a lifting device shall:
- have a cab, screen, canopy guard or other adequate protection for the operator where the operator may be exposed to the hazard of falling material; and,
- when it is a pneumatic or hydraulic hoist, have controls that automatically return to their neutral position when released. *R.R.O. 1990, Reg. 851, s. 51 (1) (d), (e).*

Inspections
Inspections are essential in the operation of lifting devices:
- a lifting device must be inspected by a competent person prior to being used for the first time and thereafter on an annual basis or more frequently if recommended by the device manufacturer. The inspection report must be signed by the competent person and kept on file by the faculty/department that owns the equipment.
- visual and operational inspections must be performed by the competent operator on a periodic basis (this may be daily, weekly, monthly, etc., depending on use). All moving parts and safety features should be examined and/or tested for excessive wear or damage that may affect the device's ability to handle a load safely.
- a lifting device must not be used if there is an element of doubt regarding how well it may perform. The device must be repaired or serviced prior to being used for materials handling operations. If a (potential) fault is discovered or suspected, ensure that the device is tagged appropriately and taken out of service until it can be inspected/repaired by a competent person.

Maintenance
Ensure that the lifting device is properly maintained following manufacturer's instructions and is repaired as necessary. If repairs are needed, the device must be tagged "out of service" until the device is safe to use again. A competent person must perform the maintenance and/or repair work.

General Operating Guidelines
Following are some general operating guidelines for lifting devices:
- do not operate a device that is not clearly marked with maximum load capacity
- do not exceed the lifting device's maximum rated load
- do not operate a device that appears to have damage, wear or has been tagged "out of service"
- ensure that the load will not pass over any workers or part of the operator's body
- ensure that a signaler is present when the path of travel of the lifting device or its load is not in full view
- watch for potential pinch points and keep hands and body parts clear of the load
- lift the load with slow, controlled and even motions and ensure that the load is under control at all times
- if possible, loads should be carried as close to the ground or floor as the situation permits
- where a worker may be endangered by the rotation or uncontrolled motion of a load, one or more guide ropes is used to prevent rotation or other uncontrolled motion
- never leave a load unattended

- leave the lifting device in the “neutral position”, and secured against accidental movement
- in case of emergency or during inspection, repairing, cleaning or lubricating, ensure that the crane or hoist is locked and tagged out so that inadvertent start-up does not occur
- in general, conduct the operation so that no one would be injured if there were an equipment failure
- where needed, assess working environments for risks such as potential for contacting power lines, pedestrian movement, visibility, and condition of work surfaces

Workplace Specific Procedures
In addition to the above procedures (guidelines) a second set of operating procedures should be developed and implemented to address hazards that are specific to the workplace and the lifting device being used. Applicable workers should be notified and trained on any workplace specific procedures and faculty/department should keep any training records on file.

Understanding Load Characteristics

- operators must know the rated capacity of the lifting device (this information should be plainly visible on the device
- prior to moving a load, determine or estimate the weight:
  - examine the shipping papers
  - examine any work orders or design drawings associated with the item
  - get a second estimate from a co-worker
  - if the weight is not known, try slowly lifting the load an inch or two - try not to exceed 50% of the device’s lift capacity
  - if the device appears to be struggling or straining (i.e. lift truck wheels come off of floor, steering is difficult), contact the supervisor to determine the best course of action
- if rigging gear such as ropes, chains or slings are required (such as for hoists and cranes), ensure that the gear will be used well within its safe working load (SWL)
  - most wire rope slings have SWL inscribed on the end fitting - if it is not there, contact the manufacturer or refer to a standards chart for a weight load test
  - fibre slings may have a different label with vertical, choker and basket weight limits usually sewn on the inside of the strap - if the fibre sling has no SWL inscribed on it, get a stronger sling with this information
  - wire ropes and fibre slings must be inspected before each use - look for evidence of kinking, crushing or heat damage
  - some broken wires are normal on the outside of a strand but if six or more broken wires are found within one lay of strand length, then the rope should be discarded
  - inspect any other fittings that are to be used prior to operation - do not use if cracked, bent or cannot be properly attached
  - replace any rope, shackle, sling, etc. if there are any doubts about its capabilities and fitness for use
- securing the load
  - cranes and hoists are designed for vertical lifts only - any side-pulling or in-pulling may damage the device and/or the rigging assembly
  - ensure that any sharp corners on the load are packed or otherwise protected to prevent cutting or damaging the rope or sling being used for the lift
  - determine the number of slings required - depends on the centre of gravity of the load, the weight, the sling angles and the type of hitch being used
  - as the sling angle decreases, the load experienced by the sling increases - generally, the minimum allowable sling angle to prevent overloading and/or slippage is 60°
- ensure that the load is stable
  - if not, use shrink-wrap or strapping
  - if the load is an unusual size or shape, try to determine the centre of gravity

Operator Guidelines

The operator must:

- be competent (trained)
- not be distracted when using a lifting device, especially while handling a load
- wear appropriate personal protective equipment which may include, but not limited to, approved head protection, gloves, eyewear and footwear
- check overhead clearance before lifting