Safety Absolute Brief Facts

Mechanical Stored Energy
Stored energy is energy in the system which is not being used. Once the energy is released it provides the power for the work to be done. When stored energy is released in an uncontrolled manner, individuals may be crushed or struck by objects, moving machinery, equipment, or other items. A hazardous energy control program is used to maintain worker safety by ensuring all forms of potential energy are controlled to prevent inadvertent movement of the conveyance being worked on.

Hazardous energy control programs involve the following elements:

- Identify sources of hazardous energy in the workplace
- Perform a hazard and risk assessment for the sources of hazardous energy
- Implement energy controls and procedures
- Provide training

Types of Stored Energy:
Stored energy can be electrical, mechanical, gravitational, hydraulic, kinetic, or pneumatic. Common examples are:
Springs, suspended loads, rotating flywheels, hydraulic systems, air, gas, steam, water pressure, etc. In the conveyance industry, you will mostly be exposed to mechanical, hydraulic, and gravitational.

Mechanical – energy is contained in an item under tension. A coiled or compressed spring will release stored energy in the form of fast movement when the spring expands.

Hydraulic – energy is stored within liquid that is pressurized by an outside source. When under pressure, the fluid can be used to move heavy objects, machinery, or equipment.

Gravitational - energy related to the mass of an object and its distance from the ground when it is put in motion. The heavier the object, and the further it is from the ground, the greater its gravitational energy. For example, a 10 pound load falling from a loader 20 feet above the ground has greater gravitational energy than the same load falling from 12 feet high.

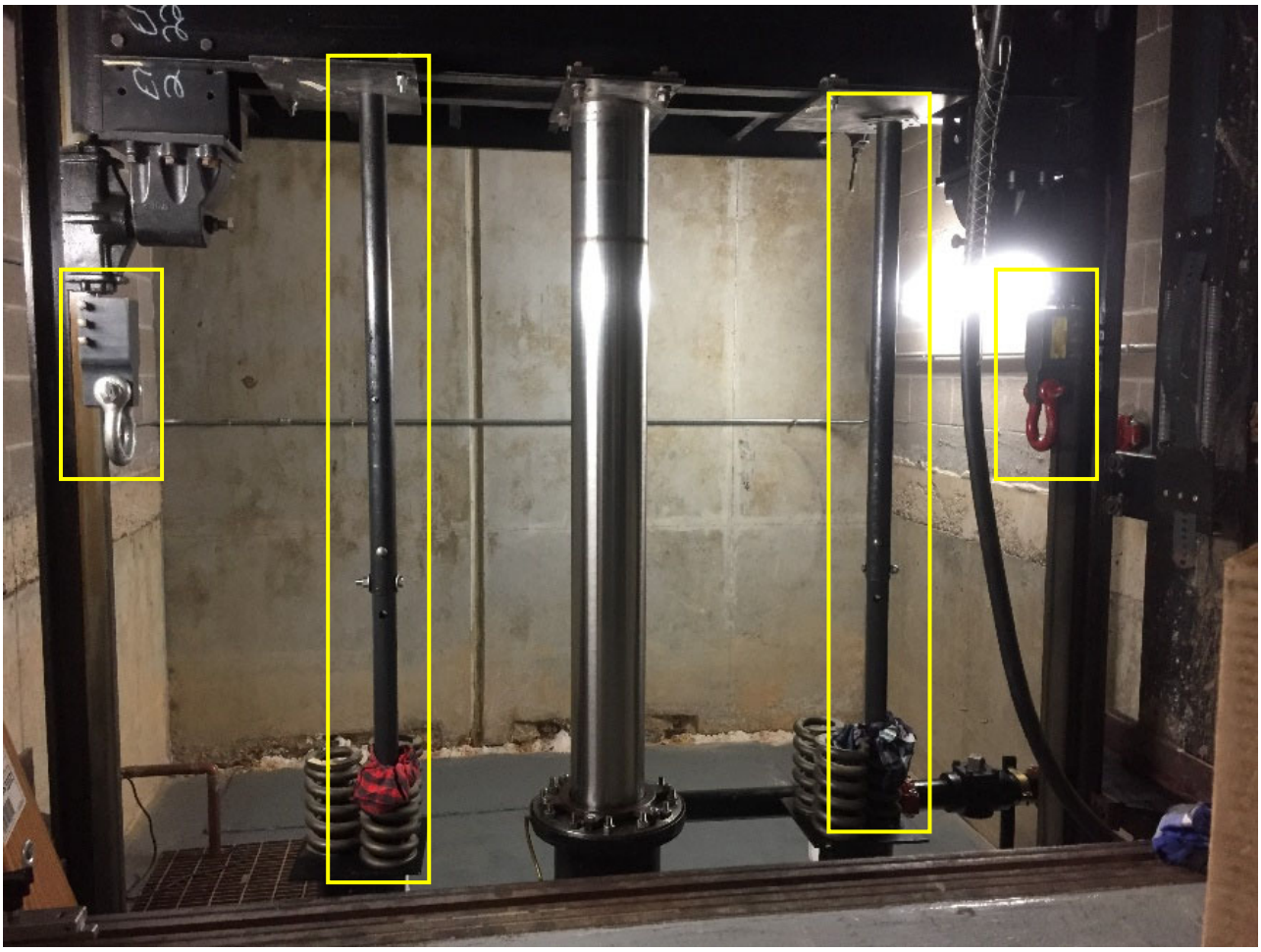
What do you do with stored energy?
Dissipate (use up the energy) or restrain (keep from use) stored energy. Methods to dissipate or restrain stored energy include grounding, repositioning, bleeding, venting, blocking, etc.

Make sure you understand all components of the system on which you are working and always conduct a risk assessment of each task to identify all hazards and methods to be used as controls. The risk assessment will outline all situations where a worker could be exposed to hazards. This assessment includes answering the “what-if’s” questions. For example, what if a barrier or guard was removed or by-passed? Or, what if a hydraulic valve releases pressurized fluid when it is removed for repair? By considering scenarios of what could happen, controls can be implemented for all possible situations

Before an elevator car is disconnected from its normal driving means (the jack for hydraulics or the hoisting cables or belts for tractions), two temporary means of supporting the car shall be in place – one acting as a backup to the other. In addition, remove power by locking out the disconnect switch and tag to identify individuals. Samples of supporting means: pipe stands, rail blocks, chain fall/chain hoist, jacks.

Hydraulic elevators

When working under a hydraulic elevator, devices such as jacks, pipe stands, rail blocks, etc. shall be installed to prevent the elevator from injuring workers in the pit. When work is to be done on any part of the hydraulic system (piping, packing, valve, etc.,), the car shall be landed or hung, hydraulic pressure relieved and appropriate lockout/tagout procedures implemented. The following picture shows a hydraulic elevator supported by pipe stands, and rail blocks attached for redundant back-up support.



Pipe supports and rail blocks.

Escalator/Moving Walk Walks

In addition to lockout/tagout, whenever working within the escalator/moving walk truss where 10% or more of the escalator steps are removed, a mechanical blocking device shall be activated to prevent the escalator from moving due to an unbalance of weight. If the unit is not equipped

with a mechanical blocking device, the drive chain and/or step axles must be secured to the truss braces to prevent movement in either direction as shown below.

Step axles secured to the truss brace.

Summary

The intent of this Safety Absolutes Brief Fact Sheet and Procedure is to make sure that all mechanics and apprentices fully understand how to work on components of a conveyance system without the presence of hazardous stored energy. Complete control of the conveyance must be always maintained while working on any system that could store energy. The system must be locked out/tagged out and any stored energy relieved.

Through the Alliance between OSHA's 10 Regional Offices and the Elevator Contractors of America (ECA), Elevator Industry Work Preservation Fund (EIWPF), International Union of Elevator Constructors (IUEC), National Association of Elevator Contractors (NAEC), National Elevator Industry Educational Program (NEIEP), and National Elevator Industry Inc. (NEII), collectively known as The Elevator Industry Safety Partners, developed this Industry Specific Training for informational purposes only. It does not necessarily reflect the official views of OSHA or the U.S. Department of Labor. March 2025

Under the Occupational Safety and Health Act, employers are responsible (http://www.osha.gov/as/opa/worker/employer-responsibility.html) for providing a safe and healthy workplace and workers have rights (https://www.osha.gov/workers). OSHA can help answer questions or concerns from employers and workers. OSHA's On-Site Consultation Program (https://www.osha.gov/consultation) offers free and confidential advice to small and medium-sized businesses, with priority given to high-hazard worksites. For more information, contact your regional or area OSHA office (https://www.osha.gov/contactus/bystate), call 1-800-321-OSHA (6742), or visit https://www.osha.gov/.