

Indiana Department of
Labor



Bureau of Mines

Director of Mines
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HOISTING ENGINEER'S STUDY GUIDE



QUALIFICATIONS

- **Must hold an Indiana Miners license.**
- **Capable of operating a hoist.**
- **Must have one year mining experience.**
- **Has at least twenty (20) hours practical experience under the supervision of a certified hoisting engineer.**
- **An applicant for examination must pay the Bureau of Mines an examination fee of twenty-five dollars (\$25.00).**
- **Must prove to the board (by written,)**
 - **Thorough knowledge of the coal mining laws in this state pertaining to hoisting engineer.**
 - **Thorough knowledge of requirements of the coal mining laws pertaining to hoisting.**
 - **Receive a grade of seventy-five percent (75%) or higher on the examination.**

SECTION 1

- Where men are transported into or out of a mine by hoists, a properly certified hoisting engineer shall be on duty continuously while any person is underground, except as provided in subsection. (b).
- Every hoist used to transport persons at a mine other than hoists used in excavating shafts or slopes shall be equipped with over speed, over wind and automatic stop controls unless a second engineer is on duty. Every hoist used to transport such persons shall be equipped with brakes capable of stopping the platform, cage or other device for transporting persons when fully loaded: and with hoisting cable adequately strong to sustain the fully loaded platform, cage, or other device for transporting persons, and have a proper margin of safety. Cages or platforms which are used to transport persons in vertical shafts, except cages or platforms which are also used to transport coal shall be equipped with safety catches that act quickly and effectively in an emergency, and the safety shall be tested at least once every two (2) months. Every hoist that is used to transport persons at a mine shall be inspected daily. Where persons are transported into or out of a mine by hoist, a qualified hoisting engineer shall be on duty while any person is underground. No such engineer, however, shall be required for automatically operated cages, platforms, or elevators.
- The hoisting engineer shall operate the empty cages up and down the shaft at least (1) one round trip at the beginning of each shift and after the hoist has been idle for (1) one hour or more before hoisting or lowering men.
- An accurate and reliable indicator, showing the position of the cage or trip, shall be placed so as to be in clear view of the engineer, unless the position of the cage or trip is clearly visible to the engineer at all times.
- The rope shall have at least three (3) full turns on the drum when extended to its maximum working length and shall make at least one (1) full turn on the drum shaft or around the spoke of the drum, in case of a free drum, and be fastened securely by means of clamps.
- The hoisting rope shall be fastened to its load by a spelter-filled socket or by a thimble and adequate number of clamps properly spaced and installed.

- Any rope attached to a cage, man-car, or trip used for hoisting or lowering men shall be provided with two (2) bridle chains or cables connected securely to the rope at least three (3) feet above the socket or thimble and to the cross piece of the cage or to the man-car or trip.
- Hoisting equipment, including the headgear, cages, ropes, connections, links and chains, shaft guides, shaft walls, and other facilities shall be inspected daily by a competent person designated by the management. Such inspector shall report immediately to his superior any defects found, and any such defects shall be corrected promptly. The person making such examination shall make a daily permanent record of each inspection, which shall be open for inspection by interested persons.
- The engineer in charge of the hoisting engine shall allow no person to interfere with it or any part of the machinery, and no person shall interfere, or in any way intimidate the engineer in the discharge of his duties. Loitering in the engine room shall be prohibited, and the hoisting engineer shall hold no conversation with any officer of the company or other person while the engine is in motion, or while his attention should be occupied with the business of hoisting. A notice to this effect shall be posted on the engine house in some conspicuous place. The engineer shall thoroughly inform himself on the established code of signals. Signals must be delivered in the engine room in a clear and unmistakable manner.
- There shall be a code of signals at each underground mine:
 - One (1) bell: shall signify to hoist coal, an empty cage, and to stop either when in motion.
 - Two (2) bells: shall signify that men are coming up or going down: when a return signal is received from the engineer, the men will get on the cage and ring One (1) bell to hoist:
 - Three (3) bells: The engineer's signal for men to get on the cage shall be.
 - Four bells (4): shall signify to hoist slowly, implying danger.

A copy of the above code of signals shall be printed and conspicuously posted at the top and bottom of each shaft, in the engine room, and at each landing.

- Whenever the hoisting or lowering of men occurs before daylight or after dark, or when the landing at which men take or leave the cage is obscured by steam or otherwise, there shall be maintained at each landing a light sufficient to show the landing and objects in immediate proximity thereto, and as long as men are underground a good light shall be maintained at the bottom of the shaft, so that persons coming to the bottom may discern the cage and objects in the vicinity.

SECTION 2

- Cages used for hoisting men shall be of substantial construction; (with sides enclosed to height of at least 6 feet and adequate steel bonnets; with enclosed sides; with gates, safety chains, or bars across the ends of the cage when men are being hoisted or lowered and with sufficient handholds or chains for all men on the cage to maintain their balance. A locking device to prevent tilting of the cage shall be used on all self-dumping cages when men are transported thereon.
- The floor of the cage shall be constructed so that it will be adequate to carry the load and so that it will be impossible for a workman's foot or body to enter any opening in the bottom of the cage.
- The speed of the cage in shafts shall not exceed six hundred (600) feet per minute when men are being hoisted or lowered. The speed of the car in a slope shall not exceed four hundred (400) feet per minute when men are being hoisted or lowered.
- Two (2) independent means of signaling shall be provided between the top, bottom, and all intermediate landings of shafts and slopes and the hoisting station. At least one (1) of these means of signaling shall be audible to the hoisting engineer.
- Workmen shall wear safety belts while doing work in or over shafts. When men are working in the shaft, a qualified attendant shall be on duty at the cage station designated by the supervisor in charge.
- An attendant shall be on duty at the surface and all other cage stations when men are being hoisted or lowered at the beginning and end of each of operating shift. Persons entering or leaving the mine at other times shall be properly instructed in the use of the signal system at the mine.

- Where automatic elevators are used, and the elevator is in charge of a competent person, no other attendant shall be required at the elevator station. (a) The doors of automatic elevators should be equipped with interlocking switches so arranged that the elevator car will be immovable while any door is opened or unlocked, and arranged so that such door or doors cannot be inadvertently opened when the elevator car is not at a landing.
 - A "Stop" switch should be provided in the automatic elevator compartment that will permit the elevator to be stopped at any location in the shaft.
 - A slack cable device should be used where appropriate on automatic elevators which will automatically shut-off the power and apply the brakes in the event the elevator is obstructed while descending.
 - Each automatic elevator should be provided with a telephone or other effective communication system by which aid or assistance can be obtained promptly.
- All open entrances to shafts shall be equipped with safety gates at the top and at each landing except at bottom landings. Such gates shall be self-closing and shall be kept closed except when the cage is at such landing. Gates shall not be required at the dumping point of self-dumping cages or skips.
- Positive stop blocks or derails shall be placed near the top and at intermediate landings of slopes and at the approaches to all shaft landings
- At the bottom of each hoisting shaft and at intermediate landings, a "run-around" shall be provided for safe passage from one side of the shaft to the other. This passageway shall be not less than five (5) feet in height and three (3) feet in width
- Ice shall not be permitted to accumulate excessively in any shaft where men are hoisted or lowered.
- No person shall ride on a loaded cage.
- No person shall approach nearer than six (6) feet to any cage landing when such cage is not at rest at such landing; or crowd on to said cage in a rude or boisterous manner; or enter upon any such cage when there are already upon the same, one (1) person for each three (3) square feet of floor space of such cage; Provided , however, that nothing herein contained shall affect any person in charge of the operation of such cage, or the machinery or affecting same.

- **Hoists and elevators shall be examined daily and such examinations shall include, but not be limited to, the following:**
 - **Elevators. A visual examination of the rope for wear, broken wires, and corrosion, especially at excessive strain points such as near the attachments and where the rope rests on sheaves;**
 - **Hoists and elevators.**
 - **An examination of the rope fastenings for defects;**
 - **An examination of safety catches;**
 - **An examination of the cages, platforms, elevators, or other devices for loose, missing or defective parts;**
 - **An examination of the head sheaves to check for broken flanges, defective bearings, rope alignment, and proper lubrication; and**
 - **An observation of the lining and all other equipment and appurtenances installed in the shaft.**
- **A record shall be made in a book of the tests, of the safety catches or other devices. Each entry shall be signed by the person making the tests and countersigned by a responsible official.**
- **Hoists shall have rated capacities consistent with the loads handled. An accurate and reliable indicator of the position of the cage, platform, skip, bucket, or cars shall be provided.**
- **At the completion of each daily examination the person making the examination shall certify, by signature and date, that the examination has been made. If any unsafe condition is found during the examinations the person conducting the examination shall make a record of the condition and the date. Certifications and records shall be retained for one year.**