NEBRASKA ADMINISTRATIVE CODE

LAST REVISION DATE: June 13, 2007

TITLE 230 - NEBRASKA WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR

CHAPTER 1 - SAFETY CODE FOR ELEVATORS, ESCALATORS AND OTHER ~~PASSENGER~~ CONVEYANCES USED FOR PASSENGERS OR MATERIALS UNDER THE CONVEYANCE SAFETY ACT

001. General.

A. This chapter is adopted pursuant to ~~*Neb. Rev. Stat.* § 48-418.12 (Reissue 2004) and LB 489, 99th Leg, 2nd Sess. (Neb. Laws 2006)~~, *Neb. Rev. Stat.* §§48-2501 to 48-2533 (Cum. Supp. 2006), and LB 265, 100th Leg., 1st Sess. (2007 Neb. Laws), and shall be known as the Nebraska ~~Elevator~~ Conveyance Safety Code. A copy of the Nebraska ~~Elevator~~ Conveyance Safety Code will be kept on file in the offices of the Commissioner of Labor, Nebraska Workforce Development, Department of Labor, 550 South 16th Street, Lincoln, Nebraska.

B. The provisions of this chapter shall apply to the construction, operation, inspection, testing, maintenance, alteration, and repair, in this state, of the following:

1. Conveyances that are not in private residences;

2. Automatic guided transit vehicles on guideways with an exclusive right-of-way, including automated people movers; and

3. Conveyances in private residences, located in counties that have a population of more than one hundred thousand inhabitants, except that such conveyances are subject to inspection only at installation.

C. The provisions of this chapter shall not apply to:

1. Conveyances under the jurisdiction of, and subject to inspection by, the United States government;

2. Conveyances used exclusively for agricultural purposes; ~~or~~

3. Conveyances in private residences in counties that have a population of one hundred thousand or less inhabitants;

4. Personnel hoists within the scope of the American National Standards Institute and American Society of Safety Engineers (ANSI/ASSE) Safety Requirements for Personnel Hoists on Construction and Demolition Sites A10.4;

5. Material hoists within the scope of American National Standards Institute and American Society of Safety Engineers (ANSI/ASSE) Safety Requirements for Material Hoists A10.5;

6. Manlifts within the scope of American National Standards Institute and American Society of Mechanical Engineers (ANSI/ASME) Safety Standards for Belt Manlifts A90.1;

7. Mobile scaffolds, towers and platforms within the scope of American National Standards Institute and Security Industry Association (ANSI/SIA) A92.1 et seq.;

8. Powered platforms and equipment for exterior and interior maintenance within the scope of American National Standards Institute and American Society of Mechanical Engineers (ANSI/ASME) Safety Requirements for Powered Platforms and Traveling Ladders and Gantries for Building Maintenance A120.1;

9. Cranes, derricks, hoists, hooks, jacks, and slings within the scope of American Society of Mechanical Engineers (ASME) B30.1 et seq.;

10. Industrial trucks within the scope of Industrial Truck Standards Development Foundation (ITSDF) B56 Standards;

11. Portable equipment, except for portable escalators, which are within the scope of American Society of Mechanical Engineers (ASME) A17.1;

12. Tiering or piling machines used to move materials to and from storage located and operating entirely within one story;

13. Equipment for feeding, or positioning materials at machine tools, printing presses, and similar equipment;

14. Skip or furnace hoists;

15. Wharf ramps;

16. Railroad car lifts or dumpers;

17. Line jacks, false cars, shafters, moving platforms, and similar equipment

18. Manlifts, hoists, or conveyances used in grain elevators or feed mills;

19. Dock levelators; or

20. Stairway chair lifts and platform lifts.

002. Definitions.

For purposes of these regulations, the following definitions apply:

A. "Act" refers to the Conveyance Safety Act, *Neb. Rev. Stat.* §§ 48-2501 to 48-2533 (Cum. Supp. 2006), as amended by LB 265 (Laws, 2007).

B. "Alteration" ~~shall~~ means any change to equipment other than routine maintenance, repair or replacement, as these terms are defined herein.

C. "Applicant" shall mean the same as "person" under the Conveyance Safety Act, at *Neb. Rev. Stat.* § 48-2502(7).

D. "Approved Alternative" means any method, element, material, process or use in the construction, design, operation, inspection, testing, maintenance, alteration, or repair of elevators and other conveyances subject to the jurisdiction of the Commissioner and not otherwise exempted by statute, for which written approval is issued by the Commissioner or, upon designation, by the state elevator inspector, subject to a showing of good cause and a showing that the safety of the users of the conveyance will not be compromised by the approved alternative.

E. "Certificate of inspection" means a document issued by the state elevator inspector, certifying that a conveyance has been inspected and has met the statutory and regulatory requirements, that it is in a safe and satisfactory condition and is properly constructed and maintained, and may be put into operation or to continue to operate in this State.

F. "Commissioner" means the Commissioner of Labor of the Nebraska Workforce Development, Department of Labor.

G. "Control room" means an enclosed control space outside the elevator hoistway that contains the motor controller and may also contain other electrical or mechanical equipment, except the electric driving machine or hydraulic machine;

H. "Conveyance Advisory Committee" means the committee created by the Conveyance Safety Act, which has the membership, powers and duties in accordance with the Act, at *Neb. Rev. Stat.* §§ 48-2503 and 48-2504.

I. "Conveyances" means the following equipment, including their associated parts and hoistways, that are not exempted from the Conveyance Safety Act by *Neb. Rev. Stat.* § 48-2508:

1. Hoisting and lowering mechanisms equipped with a car which moves between two or more landings, including elevators;

2. Power driven stairways and walkways for carrying persons between landings, including:

a. Escalators; and

b. Moving sidewalks;

3. Hoisting and lowering mechanisms equipped with a car, which serve two or more landings and is restricted to the carrying of material by its limited size or limited access to the car, including:

a. Dumbwaiters;

b. Material lifts and dumbwaiters with automatic transfer devices; and

c. Conveyors and related equipment within the scope of American Society of Mechanical Engineers B20.1.

J~~B~~. "Elevator" ~~shall~~ includes:

1. Any hoisting or lowering mechanism equipped with a car or platform which moves in guides in a substantially vertical direction and which serves two or more floors of a building or structure;

2. An escalator;

3. A power-driven incline;

4. A continuous stairway used for raising or lowering passengers;

5. Moving sidewalks;

6. Dumbwaiters;

7. Tray conveyors.

K. "Emergency Elevator Mechanic License" means a license issued by the state elevator inspector to an individual, not currently licensed as an elevator mechanic, who meets certain qualifications specified in these regulations, when sufficient proof has been provided to the state elevator inspector by a licensed elevator contractor, employer or other person, that an emergency exists in the State due to natural disaster, work stoppage, or similar significant event, and the number of persons in the State holding elevator mechanic licenses is insufficient to cope with the emergency.

L. "Independent" means, except within the scope of his or her employment with the state agency, not dependent; not influenced by the thought or action of others; free from the influence, guidance, or control of another or others; not dependent on or affiliated with a larger or controlling entity, group or system.

M~~C~~. "Inspection" ~~shall~~ means a careful examination by the state elevator inspector of elevators in this state under ~~*Neb. Rev. Stat.* §§ 48-418 to 48-418.14 (Reissue 2004)~~ the statutory authority set out in §001(A) of these regulations, as well as the ~~and~~ regulations enacted thereunder. Inspection may include an examination of parts and equipment of an elevator, its operation, the process and procedures of its installation and repair, any alterations made after installation, the building or structure in which the elevator is housed, documentation, records and blueprints related to the elevator, and any other

matter deemed necessary by the elevator inspector to assure that the elevator is in a safe and satisfactory condition and is properly constructed and maintained. Inspection shall include:

1. Preliminary inspection: any examination or review conducted by the elevator inspector outside the site or physical location of the elevator.

2. Initial inspection: the first inspection that has been conducted by the state elevator inspector at the site or physical location of an elevator.

3. Annual inspection: the inspection required by *Neb. Rev. Stat.* § 48-418.01.

4. Special inspection: any inspection requested of the elevator inspector by the owner or user of the elevator.

N. "Interested Person" means a person who can demonstrate a specific and legally recognizable interest in the subject matter of an administrative action, and who can show that he, she or it has been directly and substantially affected by the decision.

O. "Licensed Elevator Contractor" means any person who is engaged in the business of contracting services for erecting, constructing, installing, altering, servicing, testing, repairing, or maintaining conveyances, who has obtained a license from the Commissioner of Labor, and who has the qualifications, powers and duties prescribed by the Act;

P. "Licensed Elevator Mechanic" means any person who is engaged in erecting, constructing, installing, altering, servicing, repairing, testing, or maintaining conveyances; and who has obtained a license from the Commissioner of Labor, and who has the qualifications, powers and duties prescribed by the Act.

Q. "Machine room" means an enclosed machinery space outside the hoistway of the elevator that contains the electric driving machine or hydraulic machine, and may contain other electrical or mechanical equipment.

R. "Machine-Room-Less (MRL) Elevator" means an elevator designed so that the driving machine for the unit is located in the hoistway rather than in a separate elevator machine room.

S. "Machinery space" means a space inside or outside of the hoistway that contains the elevator mechanical equipment, and may contain electrical equipment, including the electric driving machine or hydraulic machine;

T~~D~~. "Repair" ~~shall~~ means the restoration of existing parts to meet elevator code standards existing at the time the elevator was installed.

U~~E~~. "Replacement" ~~shall~~ means the substitution of a part in its entirety with another part, which is the same as, or substantially the same as, the part being replaced, and which meets the elevator code standards existing at the time the elevator was installed.

V~~F~~. "Substantial Alteration" ~~shall~~ means any alteration to a elevator covered by these regulations whose cost exceeds fifteen hundred dollars ($1,500.00).

W. "Temporary Elevator Mechanic License" means a license issued by the state elevator inspector to an individual, not currently licensed as an elevator mechanic, who meets certain qualifications specified in these regulations, when sufficient proof has been provided to the state elevator inspector by a licensed elevator contractor, employer or other person, of a short-term immediate need for additional elevator mechanics.

003. Codes and Standards.

The following codes and standards ~~Commissioner of Labor~~ have been adopted ~~adopts as~~ by reference and incorporated into the Nebraska Conveyance Safety ~~Elevator~~ Code, ~~the following standards and specifications~~ as provided in these regulations:

A. The ASME A17.1 / CSA B44 — 2007 Safety Code for Elevators and Escalators, ~~International Safety Code for Elevators and Escalators A17.1 (2004), incorporated herein by reference and~~ which is available for viewing at the offices of the Commissioner of Labor, Nebraska Workforce Development, Department of Labor, 550 South 16th Street, Lincoln, Nebraska.

~~B. The American Society of Mechanical Engineers, International Safety Standards for Platform Lifts and Stairway Chairlifts A18.1 (2003), incorporated herein by reference and available for viewing at the offices of the Commissioner of Labor, Nebraska Workforce Development, Department of Labor, 550 South 16th Street, Lincoln, Nebraska.~~

B~~C~~. The ASME B20.1 — 1996 Safety Standard for Conveyors and Related Equipment (Addendum "G-1"), and the ASME B20.1b — 1998 Addenda (Addendum "G-2"), published by the American Society of Mechanical Engineers ~~International Safety Standard for Conveyors and Related Equipment B20.1-2000 (2001)~~, ~~incorporated herein by reference and available for viewing at the offices of the Commissioner of Labor, Nebraska Workforce Development, Department of Labor, 550 South 16th Street, Lincoln, Nebraska~~.

C~~D~~. The Automated People Mover Standards-Part 1, ASCE 21-05 (2006) (Addendum "H-1"), Automated People Mover Standards-Part 2, ASCE 21-98 (1998) (Addendum "H-2"), and Automated People Mover Standards-Part 3, ASCE 21-00 (2000) (Addendum "H-3") published by the American Society of Mechanical Engineers.

004. Construction or Installation of Elevator: Preliminary Inspection.

Prior to the commencement of construction or installation of an elevator, the contractor or installer shall submit a completed application, which shall include blueprints, together with the applicable fee, to the chief elevator inspector for a preliminary inspection. The application form shall be available, free of charge, in the office of the chief elevator inspector.

005. Substantial Alterations: Preliminary Inspection.

Prior to the commencement of any substantial alterations, as defined in these regulations, the contractor or other responsible party shall submit a completed application, which shall include blueprints, together with any applicable fee, to the chief elevator inspector for a preliminary inspection. The application form shall be available, free of charge, in the office of the chief elevator inspector.

006. Non-Compliant Elevators: Temporary Operation.

An elevator which does not comply with ~~*Neb. Rev. Stat.* §§ 48-418 to 48-418.14~~ the Conveyance Safety Act and/or these regulations, as determined by the chief elevator inspector, may be permitted to operate on a temporary basis, under such terms and conditions as may be imposed by the chief elevator inspector, provided that the chief elevator inspector has determined the following:

A. No mechanical or electrical failure has occurred or is imminent;

B. User and/or passenger safety shall be maintained during the temporary operation of the noncompliant elevator.

007. Annual Inspection.

The state elevator inspector shall inspect or cause to be inspected, all passenger and freight elevators in this state at least once every twelve months in order to determine whether or not the elevator:

A. Is properly constructed;

B. Is in safe and satisfactory condition; and

C. Is maintained for the purposes for which it is used.

008. Inspection Fees.

The fees for ~~each~~ inspections ~~of any elevator covered by *Neb. Rev. Stat.* §§ 48-418 to 48-418.14, LB 489, and/or these regulations~~, conducted by the chief elevator inspector or his assignees, shall be as follows:

A. For elevators (not including escalators, moving sidewalks, conveyors, or dumbwaiters):

1. Preliminary Inspections. The fee for a preliminary inspection shall be one hundred and twenty-five dollars ($125.00).

2. Initial Inspections.

a. For a unit comprising five floors or less, the fee for an initial inspection shall be one hundred dollars ($100.00); and

b. For a unit comprising more than five floors, an initial inspection fee of one hundred dollars ($100.00), plus an additional fee of five dollars ($5.00) for each floor over five.

3. Annual Inspections.

a. For a unit comprising five floors or less, the fee for an annual inspection shall be one hundred dollars ($100.00); and

b. For a unit comprising more than five floors, an annual inspection fee of one hundred dollars ($100.00), plus an additional inspection fee of five dollars ($5.00) for each floor over five.

4. Special Inspections. The costs of a special inspection shall include a fee of one hundred and fifty dollars ($150.00), plus the expenses incurred by the inspector in connection therewith.

B. For escalators, moving sidewalks, conveyors, and dumbwaiters:

1. Preliminary Inspections. The fee for a preliminary inspection shall be one hundred and twenty-five dollars ($125.00).

2. Initial Inspections.

a. For a unit comprising five floors or less, the fee for an initial inspection shall be one hundred dollars ($100.00); and

b. For a unit comprising more than five floors, an initial inspection fee of one hundred dollars ($100.00), plus an additional fee of five dollars ($5.00) for each floor over five.

3. Annual Inspections.

a. For a unit comprising five floors or less, the fee for an annual inspection shall be one hundred dollars ($100.00); and

b. For a unit comprising more than five floors, an annual inspection fee of one hundred dollars ($100.00), plus an additional inspection fee of five dollars ($5.00) for each floor over five.

4. Special Inspections. The costs of a special inspection shall include a fee of one hundred and fifty dollars ($150.00), plus the expenses incurred by the inspector in connection therewith.

C. The inspection fees as set forth herein shall be paid by the owner or user for each elevator inspected by the state elevator inspector before the inspection certificate is issued.

D. Inspection Not Required. Inspection of an elevator covered by these regulations shall not be required:

1. When any owner or user of such elevator:

   a. Obtains an inspection by a representative of a reputable insurance company licensed to do business in Nebraska; and

   b. Obtains a policy of insurance from such company on such elevator; and

   c. Files with the Commissioner of Labor a certificate of inspection by the insurance company and a statement by the insurance company that such elevator is insured.

2. If the elevator is subject to an annual inspection under a city ordinance that meets the standards of these regulations.

009. New Conveyance Installations

A. All new conveyance installations in counties with populations of more than 100,000 inhabitants shall be performed by:

   1. A licensed elevator mechanic under the control of a licensed elevator contractor; or by

   2. A licensed elevator contractor, who shall certify that the new conveyance has been installed in compliance with the Act.

B. It is the responsibility of the licensed elevator mechanics and licensed elevator contractors who are performing the installation of a new conveyance to ensure that the installation and service complies with all applicable fire and safety codes.

010. Existing Conveyances

A. No person shall wire, alter, replace, remove, or dismantle an existing conveyance contained within a building or structure, located in counties that have a population of more than one hundred thousand inhabitants, unless such person is a licensed elevator mechanic or is working under the direct supervision of a licensed elevator mechanic.

B. It is the responsibility of the owner of a conveyance to ensure that the conveyance is maintained in compliance with all applicable fire and safety codes.

C. A person is not required to be a licensed elevator mechanic or licensed elevator contractor, or to be working under the direct supervision of a licensed elevator mechanic or licensed elevator contractor, in order to

   1. Perform non-mechanical maintenance of a conveyance; or

2. Remove or dismantle conveyances that are destroyed as a result of a complete demolition of a secured building.

011. Elevator Contractor: Licensure.

A. Any person wishing to engage in the business of an elevator contractor, in counties that have populations of more than 100,000 inhabitants, shall apply for and obtain an elevator contractor license from the commissioner. The application shall contain the information and substantially comply with the "Application for License Renewal of License / Elevator Contractor / Conveyance Safety Act," attached as Addendum "A" to this chapter.

B. Qualifications for Elevator Contractor License. An applicant seeking a license as an elevator contractor must comply with the following minimum qualifications:

1. No license shall be granted to any applicant unless the application fee required by §010 of this chapter is paid.

2. An applicant for licensure must provide evidence and documentation, satisfactory to the Commissioner, of the following:

a. Five years work experience in the elevator industry in construction, maintenance, and service or repair; and

b. Either:

i. Satisfactory completion of a written examination administered by the Conveyance Advisory Committee or its designated provider; or

ii. A valid license as an elevator contractor, from a state having standards substantially equal to those of this State; and

3. Proof of insurance, as required by the Act, at *Neb. Rev. Stat.* § 48-2527. Applicants must also provide notice to the Commissioner of any substantial alteration or cancellation of a policy, at least ten (10) days in advance of the alteration or cancellation.

012. Elevator Mechanic: Licensure.

A. Any person wishing to engage in the business of an elevator mechanic, in counties that have populations of more than 100,000 inhabitants, shall apply for and obtain an elevator mechanic license from the commissioner. The application shall contain the information and substantially comply with the "Application for License Renewal of License / Elevator Mechanic / Conveyance Safety Act," attached as Addendum — "B" to this chapter.

1. No license shall be granted to any applicant unless the application fee required by §010 is paid.

2. An applicant for licensure must demonstrate to the satisfaction of the Commissioner that the applicant possesses an acceptable combination of documented experience and education credits consisting of:

a. Not less than 3 years work experience in the elevator industry, in construction, maintenance, and service or repair, as verified by current and previous employers or contractors; and

b. Compliance with one of the following subsections—(i) or (ii) or (iii) or (iv):

i. Satisfactory completion of a written examination administered by the Elevator Safety Review Board or its designated provider, on the most recently enacted codes and standards for elevator mechanics; or

ii. Both of the following:

A. Acceptable proof that the applicant has worked as an elevator mechanic:

1. In conveyance construction, maintenance, or repair;

2. Lasting at least three (3) years, immediately prior to the effective date of the elevator mechanic's license;

3. Working without the direct and immediate supervision of a licensed elevator contractor; and

B. Satisfactory completion of a written examination approved by the Commissioner; or

iii. A certificate of successful completion of the mechanic examination of a nationally recognized training program for the elevator industry, such as the National Elevator Industry Educational Program, or its equivalent, with standards substantially similar to those set out in the "National Guidelines for Apprenticeship Standards Developed by the National Elevator Industry Education Program (NEIEP) for Elevator Constructor Mechanics (O*NET/SOC Code: 47-4021.00) in Cooperation with the U.S. Department of Labor Bureau of Apprenticeship and Training," attached as Addendum — "C" to this chapter; or

iv. A certificate of completion of an elevator mechanic apprenticeship program, registered with the Bureau of Apprenticeship and Training of the U.S. Department of Labor, whose content is substantially similar to that set out in Addendum "D" — "Apprenticeship Course Outlines."

013. Temporary or Emergency Elevator Mechanic Thirty-Day Licenses

A. Whenever sufficient proof has been provided to the state elevator inspector, by a licensed elevator contractor, employer or other person, of a short-term immediate need for additional elevator mechanics, the state elevator inspector may issue a temporary elevator mechanic thirty-day license to an individual, not currently licensed as an elevator mechanic, who meets the qualifications set forth in subsection C of this section.

B. Whenever sufficient proof has been provided to the state elevator inspector, by a licensed elevator contractor, employer or other person, that an emergency exists in the State due to natural disaster, work stoppage, or similar significant event, and that the number of persons in the State holding elevator mechanic licenses is insufficient to cope with the emergency, the state elevator inspector may issue an emergency elevator mechanic thirty-day license to an individual, not currently licensed as an elevator mechanic, who meets the qualifications set forth in subsection C of this section.

C. The state elevator inspector may issue a temporary or emergency elevator mechanic thirty-day license to an individual upon completion of the following:

1. The individual shall file an application for a temporary or emergency elevator mechanic license with the Commissioner of Labor within five (5) business days after commencing elevator mechanic work, using the form attached to these regulations as Addendum — "E": "Application for License / Extension of License / Temporary or Emergency Elevator Mechanic / Conveyance Safety Act."

2. The individual shall furnish proof of competency by submitting documentation of at least three (3) years of work experience in the elevator industry as an elevator mechanic, working without direct supervision, in this State or in any other state having standards substantially the same as those of this State.

3. A licensed elevator contractor must certify that the person has an acceptable combination of documented experience and education to enable him or her to perform work as an elevator mechanic, without direct and immediate supervision.

D. No application fee shall be required of an individual that is applying for a temporary or emergency elevator mechanic thirty-day license, or for the renewal of that license.

E. A temporary or emergency elevator mechanic license is valid for 30 days from the date issued. The Commissioner may impose restrictions on the license as to types of conveyances or geographical areas to which the license is applicable. Except for such restrictions as the Commissioner may impose, the temporary or emergency license entitles the licensee to all rights and privileges of an elevator mechanic.

F. The temporary or emergency mechanic license may be renewed by the Commissioner for good cause shown.

014. License and Registration Fees

License fees shall be as follows:

A. Initial Licenses

1. Elevator Mechanic License: $100.00.

2. Elevator Contractor License: $100.00.

B. Renewal of License

1. Elevator Mechanic License: $75.00.

2. Elevator Contractor License: $75.00.

015. Renewal of License

A. Licenses for elevator contractors and elevator mechanics, except temporary or emergency elevator mechanic licenses, shall be renewed every 2 years.

B. A licensee may renew a license by submitting a written application for renewal, accompanied by the required fee, 30 days prior to expiration of the license.

C. An applicant for renewal of an elevator mechanic license shall, in addition, provide a certificate of completion of a course designed to ensure the continuing education on new and existing rules and regulations adopted and promulgated by the Commissioner.

1. The course shall consist of not less than eight hours of instruction that shall be attended and completed within one year immediately preceding any license renewal.

2. The individual holding the elevator mechanic license shall pay the cost of such course.

3. The course shall be taught by instructors through continuing education providers selected by the Commissioner upon recommendation by the Conveyance Advisory Committee.

D. An elevator mechanic licensee who, due to a temporary disability, is unable to complete the continuing education course required under this section, prior to the expiration of his or her existing license, may apply for an extension from the state elevator inspector.

1. The request for extension of time to complete the continuing education course shall be on a form provided by the state elevator inspector, which shall be signed by the applicant.

2. The request for extension of time to complete the continuing education course shall be accompanied by a certified statement from a competent physician, attesting to such temporary disability.

3. An extension sticker, valid for ninety days, shall be issued to the licensed elevator mechanic. The sticker shall be affixed to the license. Extensions shall be renewable for periods of ninety days upon a showing that the disability continues.

4. Upon the termination of such temporary disability, the elevator mechanic licensee shall submit to the state elevator inspector a certified statement from the same physician, if practicable, attesting to the termination of such temporary disability.

016. Machine-Room-Less (MRL) Elevators

The installation of a "Machine-Room-Less elevator," as defined in §002(Q) of this chapter, shall be permitted as part of new or original construction of a building or as an alteration of or addition to an existing building, provided that it is constructed in accordance with the provisions of §§ 009 and 010 of this chapter, and with the ASME A17.1 / CSA B44 — 2007 Safety Code for Elevators and Escalators, which has been incorporated by reference and made a part of these regulations at § 003(A).

017. Flashing Visual Signal.

On all elevators that are required to operate on an emergency "Fireman's Service," a visual signal is required to flash intermittently. Once the flashing visual signal is activated by the fire initiating device, located inside the elevator machine room, elevator control room, or elevator hoistway, it shall remain flashing intermittently until cancelled by rotating the Fire Recall Switch, first to the "Reset" position, and then to the "Off" position. However, the visual signal shall not be cancelled until any and all smoke detectors, located in the elevator hoistway, elevator machine room, or elevator control room, are no longer activated.

018. Approved Alternative or Variance.

The Commissioner, or, upon designation, the state elevator inspector, may grant an alternative that varies from the rules and regulations in this chapter, provided that:

A. The request for an alternative or variance is made in writing, directed to the Commissioner, in care of the state elevator inspector;

B. The request is made on the form provided herein, or contains the same information and substantially complies with the "Application for Approved Alternative or Variance / Conveyance Safety Act," attached as Addendum — "F" to this chapter;

C. Sufficient documentation is provided with the application to show good cause for granting the alternative or variance requested;

D. Sufficient documentation is provided with the application to show that the safety of those riding in or using the conveyance will not be compromised by granting the alternative or variance; and

E. The commissioner submits the application to the Conveyance Advisory Committee for its recommendations to the Commissioner regarding each alternative or variance requested.

019. Appeal of Granting or Denial of Approved Alternative or Variance.

A. Any interested person, as defined in § 002(N) of these regulations, may file an appeal of the granting or denial of a request for an alternative or variance by the Commissioner or state elevator inspector.

B. An appeal must be filed with the agency at its official office, as set out in this section, within thirty (30) calendar days of the date that the decision was mailed by the Commissioner or state elevator inspector.

C. An appeal must be filed with the agency at its official office. Filing may be accomplished by personal delivery or mail and will be received during regular office hours of the agency. Regular business hours for the Department are from 8:00 a.m. to 5:00 p.m., Central Time, Monday through Friday, exclusive of state or federal holidays. Filings should be addressed or delivered to:

Commissioner of Labor
P.O. Box 94600
550 South 16th Street
Lincoln, NE 68508

D. An appeal must follow the form of a petition, as described in 223 NAC 5(004)(D) - Rules of Practice and Procedure for Hearings on Contested Cases.

E. The appeal shall be conducted in accordance with 223 NAC 5 - Rules of Practice and Procedure for Hearings on Contested Cases.

020. Notification of Accidents.

A. The owner of a conveyance shall notify the state elevator inspector of any accident, involving a conveyance, that has caused personal injury or property damage in excess of one thousand dollars ($1,000.00).

B. The owner of the conveyance shall notify the state elevator inspector on or before the close of business on the next business day following the accident.

C. The conveyance involved shall not be operated until the state elevator inspector has conducted an investigation of the accident and has approved the operation of the conveyance.

D. The state elevator inspector shall investigate and shall report to the commissioner:

1. The cause of any conveyance accident that may occur in the state;

2. Any loss of life or injuries sustained;

3. Such other data as may, in the judgment of the state elevator inspector, be of benefit in preventing other similar accidents.

021. Posted Notice of Discontinued Use.

A. The state elevator inspector shall adopt a suitable label to be attached to any conveyance:

1. Being operated in violation of the Act; or

2. Where the state elevator inspector determines that continued operation of the conveyance would jeopardize public safety. Such label shall provide notice that the elevator is not certified for operation, and that continued operation is a Class IV misdemeanor, in accordance with *Neb. Rev. Stat.* § 48-2533 of the Act.

B. Unauthorized removal by an owner/user or their representative of a label attached by a state elevator inspector may result in revocation of existing certification or denial of future certification until adequate assurances are made to the commissioner that occurrences initiating the affixing of the label have been resolved.

APPLICATION FOR LICENSE / RENEWAL OF LICENSE

ELEVATOR CONTRACTOR
CONVEYANCE SAFETY ACT

***Neb. Rev. Stat.* § § 48-2501 − 48-2533 (Cum. Supp. 2006)**

☐ New License ☐ Renewal of License

GENERAL INFORMATION

*Name (last, first, middle initial) _____ *Social Security No.‡ _____

*Residence: Street Address *City, State, Zip

*Business: Street Address *City, State, Zip

*Home Phone # *Work Phone #

*Cell. _____ *Fax # _____

If applicant is corporation, please provide the following:

Name _____ Fed. Tax I.D. No. _____

Business Address: Street Ste. City, State, Zip

Principal Officer Name (Residence) Address Street City, State, Zip

Agent Name Address Street City, State, Zip

(authorized to accept service of process and official notices)

* If applicant is partnership, provide * information for all partners. Use additional space on page 3 if necessary

‡ Note: Social Security numbers on application shall not be made public or be considered a part of a public record.

Prior to making this application, applicant has been engaged in the following with respect to conveyances*:

(circle where applicable):	**constructing**	**installing**	**inspecting**	**maintaining**	**servicing/repair**
(list years of experience):	_____ yrs.	_____ yrs.	_____ yrs.	_____ yrs.	_____ yrs.

* Note: A minimum of five years' work experience in the conveyance industry in construction, maintenance, and service or repair is required.

Type of Workers Utilized:

☐ **Employees** **No. of Employees** _____ ☐ **Independent Contractors No. of ICs** _____

☐ **Other** (Please specify) _____

INSURANCE Applicant has the following insurance policies in force:

☐ General Liability?

_____
Name of Insurer

_____
Policy No.

Limits: up to $_____ for injury or death of any 1 person.

Up to $_____ for injury or death of any number of persons in 1 occurrence.

☐ Property Damage?

_____
Name of Insurer

_____
Policy No.

Limits: up to $_____ for property damage in any 1 occurrence.

☐ Workers' Compensation?

_____
Name of Insurer

_____
Policy No.

_____
No. of Employees

For Renewals Only: Have the above policies been subject to cancellation or material alteration since applicant received the applicant received the previous elevator mechanic's license? ☐ Yes ☐ No
If "yes," please state nature of cancellation or material alteration and date of occurrence: _____

WORK HISTORY

List any employment you have had in the conveyance industry for the period of five years prior to the date of signing this application. Use additional sheets on page 3 if necessary.

Employer | Employed from: | To:

Address: | Supervisor

Position Title ☐Full-time ☐ Part-time | Number of employees supervised by you

Description of Duties

May we contact this employer? ☐ Yes ☐ No | Supervisor/Manager Name: | Phone No.

If you were self-employed and operated own business, provide the following for the period of five years prior to the date of signing this application. Use additional sheets on page 3 if necessary.

Name of Business: | Dates of Operation From: | To:

Address of Business: | Phone

☐ Sole Proprietorship ☐ Partnership ☐ Corporation ☐ LLC ☐ LLP ☐ Other (describe):

Describe work of business with respect to conveyances (installation, servicing/repair, etc.)

What position did you hold with respect to business (owner, member, partner, corporate officer, etc.)?

Number of workers
☐ Employees ☐ Ind. Contractors
☐Other

Name and Business Address of Any Co-Owners, Partners, Corporate Officers, etc.

BACKGROUND INFORMATION

By submitting this application, applicant is granting permission to the Nebraska Workforce Development, Department of Labor to access criminal history record information of individuals, partners and/or corporate officers identified on the application, as required by *Neb. Rev. Stat.* § 48-2521 (3) (g) (Cum. Supp. 2006), from the data banks of the Federal Bureau of Investigation, through the Nebraska State Patrol.

ACCIDENTS

Please provide a description of all accidents causing (a) personal injury and/or (b) property damage in excess of $1,000.00, which involved any conveyances that were (a) installed and/or (b) inspected, and/or (c) maintained and/or (d) serviced by the Applicant. Include all relevant details, including place and date of occurrence, and type of conveyance involved. State the cause of the accident, if known, and provide details of any personal injuries or property damage (in excess of $1,000.00) that occurred. What had the applicant done in the way of installation, inspection, maintenance, or service of the conveyance, prior to the accident? What repairs were made to the conveyance after the accident?

Note: an application fee must be submitted with this application, in the following amounts:
$ _____ Initial Application for License
$ _____ Application for Renewal of License

Typed or Printed Name of Applicant (or Authorized Person Signing on Behalf of Applicant)

_____ Name

_____ Title

_____ Signature of Applicant

_____ Date

ADDITIONAL COMMENTS (if necessary)

_____

_____

_____

_____

APPLICATION FOR LICENSE / RENEWAL OF LICENSE

ELEVATOR MECHANIC
CONVEYANCE SAFETY ACT

***Neb. Rev. Stat.* § § 48-2501 − 48-2533 (Cum. Supp. 2006)**

☐ New License ☐ Renewal of License

GENERAL INFORMATION

Name (last, first, middle initial) _____ Social Security No.‡ _____

Residence: Street Address City, State, Zip

Business: Street Address City, State, Zip

Home Phone # Work Phone #

Cell. # _____ Fax # _____

‡ Note: Social Security numbers on application shall not be made public or be considered a part of a public record.

Prior to making this application, applicant has had work experience in the following with respect to conveyances*:

(circle where applicable):	**constructing**	**installing**	**inspecting**	**maintaining**	**servicing/repair**
(list years of experience):	_____ yrs.	_____ yrs.	_____ yrs.	_____ yrs.	_____ yrs.

* Note: minimum of three years' work experience in conveyance industry construction, maintenance, and service or repair required.

EMPLOYMENT HISTORY (starting with most recent employment and going back five years; use additional space on page 3 if necessary)

Employer		Employed from: To:
Address:		Supervisor
Phone	Hours worked/week	Position Title
Description of Duties		
If you were an elevator mechanic in this position, did you work without the direct and immediate supervision of a licensed elevator contractor? ☐ Yes ☐ No		
Number of employees supervised by you		May we contact this employer? ☐ Yes ☐ No
Employer		Employed from: To:
Address:		Supervisor
Phone	Hours worked/week	Position Title
Description of Duties		

If you were an elevator mechanic in this position, did you work without the direct and immediate supervision of a licensed elevator contractor? ☐ Yes ☐ No	
Number of employees supervised by you	May we contact this employer? ☐ Yes ☐ No

Training If you completed and passed an elevator mechanic examination of a nationally recognized training program for the conveyance Industry (National Elevator Industry Educational Program or equivalent) state:

☐ **Training Program** **Location** _____ **Dates of Attendance** _____

☐ **Examination** **Location** _____ **Dates of Examination** _____

☐ **Score** _____ Please provide copy of certificate of completion with application.

Apprenticeship If you completed an apprenticeship program* for elevator mechanics, state:

☐ **Training Program** **Location** _____ **Dates of Attendance** _____

Please provide copy of certificate of completion with application.

* Note: Apprenticeship program must have standards substantially equal to those of the Conveyance Safety Act , and must be registered with the Bureau of Apprenticeship and Training of the United States Department of Labor , or a state apprenticeship council.

For Renewals Only:

I have completed the 8-hour continuing education course for elevator mechanics. ☐ Yes ☐ No

If "yes," please provide: **Location** _____

Date(s) of Attendance _____

Please provide copy of certificate of completion with application.

If "no," are you applying for extension due to temporary disability? ☐ Yes ☐ No

If "yes," please provide application for extension of time (form available from Office of Safety & Labor Standards).

BACKGROUND INFORMATION

By submitting this application, applicant is granting permission to the Nebraska Workforce Development, Department of Labor to access criminal history record information of individuals, partners and/or corporate officers identified on the application, as required by *Neb. Rev. Stat.* § 48-2521 (3) (g) (Cum. Supp. 2006), from the data banks of the Federal Bureau of Investigation, through the Nebraska State Patrol.

Note: an application fee must be submitted with this application, in the following amounts:
$ _____ Initial Application for License
$ _____ Application for Renewal of License

Typed or Printed Name of Applicant

_____ _____
Name Date

_____

Signature of Applicant

ADDITIONAL COMMENTS (if necessary)

National Guidelines for Apprenticeship Standards Developed by the National Elevator Industry Education Program (NEIEP) for Elevator Constructor Mechanic (O*NET/SOC Code: 47-4021.00) In Cooperation with the U.S. Department of Labor Bureau of Apprenticeship and Training

WORK PROCESSES

A. CONSTRUCTION/MODERNIZATION

1. SAFETY

   a. Identify job hazards
   b. What proper safety equipment to wear and use
   c. Common sense safety around elevators and escalators
   d. Fundamentals of first aid & MSDS information
   e. Avoiding electric shock, GFCI's
   f. Codes that apply to the elevator industry

2. PRINT READING

   a. Read prints
   b. Survey the hoistway for new installation and modernization
   c. Convert to meter equivalents

3. HANDLING MATERIALS & TOOLS: RIGGING & HOISTING

   a. Safety Procedures
   b. Properly handle and store elevator/escalator equipment
   c. Tie and identify knots, bends and hitches
   d. Safety procedures for hoisting heavy equipment
   e. Building a safe working platform & scaffolding
   f. Use all safety devices

4. PIT STRUCTURES

   a. Safety Procedures
   b. Introduction to the pit components and their purpose
   c. Install pit equipment: buffers, compensating sheaves, compensating ropes and chains
   d. Testing of pit equipment for proper operation

5. GUIDE RAILS

   a. Safety Procedures
   b. Prepare rails and rail runs
   c. Build templates, drop lines and plumb hoistways of single, multiple or corner post installations

d. Install guide rails
e. Use a rail gauge and align rails

6. MACHINE ROOM, ESCALATOR & OVERHEAD INSTALLATIONS

a. Safety Procedures
b. Layout and properly align & set equipment
c. Properly align sheaves, tracks and gears
d. Offset roping
e. Calibrate and test
f. Proper inspection and maintenance procedures for the equipment

7. CAR & COUNTERWEIGHT ASSEMBLY & ROPING

a. Safety Procedures
b. Assemble car and counterweight sling
c. Why elevators use counterweights
d. Proper handling & storage of wire ropes
e. Plan a rope run and learn other methods of installing and reroping

8. WIRING INSTALLATION

a. Safety Procedures
b. Terminology for various tools and electrical equipment
c. Plan and install raceway and conduit
d. Bend conduit
e. Plan wiring and pulling wires safely and efficiently
f. Accurately prepare and install traveling cables
g. Bonding and grounding equipment
h. Prepare the elevator/escalator for running operation

9. DOOR INSTALLATION

a. Safety Procedures
b. Proper terminology for doors and relating equipment
c. Install car and hoistway entrances and door equipment accurately
d. Install & adjust elevator doors, gates for passenger, freight & dumbwaiter

10. HYDRAULICS

a. Safety Procedures
b. Drill a hole for a hydraulic jack
c. Properly install and plumb the casing & jack with specific tools
d. Layout a pipe run and connections to power unit and jack
e. Hydraulic theory and valve operation
f. Adjust the valves for proper operation
g. Troubleshoot and isolate system problems

B. SERVICE/REPAIR/MODERNIZATION/CONSTRUCTION

1. BASIC WIRING/ELECTRICITY

   a. Procedures for working safely with electricity
   b. Principle on which all electrical concepts are based
   c. What is electricity and where does it come from?

2. SOLID STATE ELECTRONICS/RELAY LOGIC

   a. Safety Procedures
   b. Terminology and safety equipment used on electronic devices
   c. Binary & hexidecimal systems are related to digital circuitry
   d. Capacitors and capacitance are used on elevator equipment
   e. Inductance and inductors are used in circuits
   f. How a semi-conductor works
   g. Diode, zener diodes, photodiodes and light emitting diodes
   h. Understanding transistors and how they operate
   i. How SCR's are operated and used in elevator circuits
   j. Various digital gates and their function
   k. The functions of integrated power supplies
   l. Different configurations and uses of the Op Amp
   m. Relay logic

3. CIRCUIT TRACING/RELAY LOGIC

   a. Safety Procedures
   b. Read a wiring diagram symbol and apply it to the equipment on the job
   c. Sequence of operation of individual circuits such as starting, stopping car and hall call cancellation and direction selection
   d. Troubleshoot particular circuits that are malfunctioning
   e. Locate and repair electrical problems such as ground, opens, defective contacts and coils
   f. Troubleshoot electrical problems with confidence

C. GENERAL REPAIR/MODERNIZATION

1. REROPING, RECABLING

   a. Safety Procedures
   b. Inspecting for defective rope, selector tape & cable
   c. Staging and routing ropes, tapes & cables
   d. Shackling and socketing

2. DOOR OPERATOR & RELATING EQUIPMENT

   a. Safety Procedures

b. Passenger & freight door, gate repairs and replacements
c. Door Operators, repair, replace and adjustments
d. Door protective devices and troubleshooting

3. TRAVELING CABLE

a. Safety Procedures
b. Repair and replacement of traveler in existing hoistways

4. MOTORS, GENERATORS, BEARINGS, SHEAVES, DRIVERS

a. Safety Procedures
b. Cleaning and lubrication
c. Testing and replacing motors, generators, bearings, sheaves and drivers
d. Turn and undercut a commutator
e. Test shunt and series field coils
f. Learn how to check bearings and replace

5. ESCALATORS, MOVING WALKS & SIMILAR EQUIPMENT

a. Safety Procedures
b. Repair/replace equipment
c. Clean and lubricate
d. Maintenance on equipment

APPRENTICESHIP COURSE OUTLINES

APPRENTICESHIP COURSE OUTLINE YEAR 1

1.1 Safety for Elevator Constructors
- 1.1.1 Introduction to Safety
- 1.1.2 Safety During Construction and Maintenance
- 1.1.3 Safety During Maintenance and Repairs
- 1.1.4 Alcohol and Other Drugs
- 1.1.5SM Introduction to OSHA
- 1.1.6SM Hazard Communication
- 1.1.7SM PPE
- 1.1.8SM Materials Handling
- 1.1.9SM Tool Safety
- 1.1.10SM Electrical Safety
- 1.1.11SM Scaffold Safety
- 1.1.12SM Fall Protection
- 1.1.13SM Stairways and Ladders
- 1.1.14SM Confined Spaces
- 1.1.15SM Ergonomics
- 1.1.16SM Fire Safety

1.2 Diversity Training
- 1.2.1 Harassment and Discrimination in the Workplace
- 1.2.2 Diversity and Success
- 1.2.3 Case Studies

1.3 Customer Relations
- 1.3.1 Customer Focus
- 1.3.2 Presentation
- 1.3.3 Communications
- 1.3.4 Dealing with Customers

1.4 History

1.5 Fundamentals of Print Reading
- 1.5.1 Introduction to Installation Drawings
- 1.5.2 Detail Drawings and Material Specifications

1.6 Material Handling, Rigging and Hoisting
- 1.6.1 Tools and Material Handling
- 1.6.2 Rigging and Hoisting
- 1.6.3 Crosby Fasteners* (*CD-ROM)

1.7 Pit Structures
- 1.7.1 Pit Structures
- 1.7.2 Welding Basics* (*CD-ROM)

1.8 Guide Rails
- 1.8.1 Introduction to Guide Rails
- 1.8.2 Installation of Guide Rails

1.9 Machine Room and Overhead Installation
- 1.9.1 Machine and Sheave Installation
- 1.9.2 Elevator Control Equipment Installation

1.10 Car and Counterweight Assembly, Roping and Re-roping
- 1.10.1 Car and Counterweight Assembly and Roping
- 1.10.2 Elevator Rope and Roping
- 1.10.3 Re-roping
- 1.10.4 Elevator Cab Modernization, Refinishing and Floor Covering

APPRENTICESHIP COURSE OUTLINE YEAR 2

2.1 Basic Math Review
- 2.1.1 Elementary Technical Mathematics

2.2 Basic Electricity
- 2.2.1 Arithmetic Review
- 2.2.2 Basic Electricity Introduction
- 2.2.3 Understanding the Relationship Between Voltage, Current, and Resistance
- 2.2.4 Basic Electrical Circuit Components
- 2.2.5 Series and Parallel DC Resistive Circuits
- 2.2.6 Magnetism and Electromagnetism
- 2.2.7 DC Generators and Motors
- 2.2.8 Alternating Current Theory
- 2.2.9 Transformers
- 2.2.10 AC Motors

2.3 Meters
- 2.3.1 Introduction to Analog and Digital Meters
- 2.3.2 Meters Experiments

2.4 Advanced DC Motors and Generators
- 2.4.1 DC Generator and Motor Theory
- 2.4.2 Components of DC Motors and Generators
- 2.4.3 Types of DC Motors and Generators
- 2.4.4 Maintenance and Service

APPRENTICESHIP COURSE OUTLINE YEAR 3

3.1 Construction Wiring
- 3.1.1 Planning, Piping and Wiring
- 3.1.2 Piping the Machine Room and Hoistway
- 3.1.3 Traveling Cables

3.1.4 Wiring the Hoistway and Machine Room
3.1.5 Piping and Wiring the Car
3.1.6 Start-Up Procedures

3.2 Doors and Operators
3.2.1 Introduction to Passenger and Freight Entrances
3.2.2 Passenger Elevator Doors and Entrance Installations
3.2.3 Elevator Cab Assembly and Door Operators
3.2.4 Freight Elevator Doors and Gates
3.2.5 Passenger Door Operators
3.2.6 Freight Door Operators
3.2.7 Door Protective Devices
3.2.8 Troubleshooting Door Operators
3.2.9 Dumbwaiters

3.3 Hydraulics
3.3.1 Drilling and Casing the Jack Hole
3.3.2 Installing and Servicing the Jack
3.3.3 Piping and Temporary Operation
3.3.4 Basic Hydraulic Theory

3.4 Escalators and Moving Walks
3.4.1 Safety and General Installation Procedures
3.4.2 Escalator Components and Installation Procedures
3.4.3 Moving Walk Components and Installation Procedures
3.4.4 Escalator Safety and Terminology
3.4.5 Escalator Steps and Step Chains
3.4.6 Escalator Handrails
3.4.7 Escalator Service and Maintenance

APPRENTICESHIP COURSE OUTLINE YEAR 4

4.1 Basic Elevator Solid State Electronics
4.1.1 Capacitors and Capacitance
4.1.2 Inductors and Inductance
4.1.3 Diodes
4.1.4 Transistors and Thyristors
4.1.5 Analog Integrated Circuits
4.1.6 Digital Integrated Circuits

4.2 Circuit Tracing
4.2.1 Introduction to Circuit Tracing
4.2.2 Relays and Timers
4.2.3 Power and Power Control
4.2.4 Logic Controls
4.2.5 Constant Pressure Push Button Systems & Single Automatic Push Button Systems

4.2.6 Collective Systems
4.2.7 Variable Voltage Selective-Collective Control Systems

4.3 Elevator Maintenance
4.3.1 Hoistway Maintenance
4.3.2 Car top Maintenance
4.3.3 Machine Room Maintenance

APPLICATION FOR LICENSE / EXTENSION OF LICENSE
TEMPORARY OR EMERGENCY ELEVATOR MECHANIC
CONVEYANCE SAFETY ACT
***Neb. Rev. Stat.* § § 48-2501 − 48-2533 (Cum. Supp. 2006)**

GENERAL INFORMATION

Name (last, first, middle initial) _____ Social Security No.‡ _____

Residence: Street Address City, State, Zip

Business: Street Address City, State, Zip

Home Phone # Work Phone #

Cell. # _____ Fax # _____

‡ Note: Social Security numbers on application shall not be made public or be considered a part of a public record.

Prior to making this application, applicant has been engaged in the following with respect to conveyances*:

(circle where applicable):	**constructing**	**installing**	**inspecting**	**maintaining**	**servicing/repair**
(list years of experience):	_____ yrs.	_____ yrs.	_____ yrs.	_____ yrs.	_____ yrs.

* Note: A minimum of three (3) years' work experience in the conveyance industry is required.

WORK EXPERIENCE (starting with most recent employment and going back three (3) years; use additional space on page 3 if necessary)

Note: At Least One Form of Documentation of Work Experience Is Required for Each Job or Contract Listed.

Current Employer / Contractor Start Date of Employment / Contract:

Address: Supervisor or Contact Person

Phone: Fax:

Description of Duties

Employer Dates of Employment / Contract From: To:

Address: Supervisor or Contact Person

Phone: Fax:

Description of Duties

Employer Dates of Employment / Contract From: To:

Address: Supervisor or Contact Person

Phone: Fax:

Description of Duties

CERTIFICATION

I am a licensed elevator contractor. Based upon my own personal knowledge and/or upon information and documentation that I have obtained, I certify that _____, the applicant named herein, has a combination of documented experience and education to enable him/her to perform elevator mechanic work without direct and immediate supervision by an elevator contractor or other individual.

_____ _____
Signature Date

_____
Typed or Printed Name (last, first, middle initial)

Residence: Street Address City, State, Zip

Business: Street Address City, State, Zip

Home Phone # Work Phone #

_____ _____
Cell. # Fax #

Please state the nature of the—
(a) short-term immediate need for elevator mechanics; **or**
(b) the emergency, whether natural disaster, work stoppage, or other reason, such that the number of persons holding elevator mechanics' licenses in this State is insufficient to cope with the emergency—
such that issuance of a temporary or an emergency elevator mechanics' thirty-day license is required.

_____
_____
_____
_____
_____
_____

Note: No application fee is required for this temporary license. A temporary or emergency elevator mechanic license is valid for no more than thirty (30) days from the date of issuance. The Commissioner of Labor may impose restrictions on the license as to types of conveyances or geographical areas in which the licensee is authorized to work. This temporary or emergency elevator mechanic license may be renewed by the Commissioner for good cause shown.

I certify that the information contained in this application is true and correct

_____ _____
Signature of Applicant Date

_____
Typed or Printed Name of Applicant

ADDITIONAL COMMENTS (if necessary)

APPLICATION FOR APPROVED ALTERNATIVE OR VARIANCE / CONVEYANCE SAFETY ACT
***Neb. Rev. Stat.* § § 48-2501 − 48-2533 (Cum. Supp. 2006)**

GENERAL INFORMATION

Name (last, first, middle initial)	Social Security No.‡
Residence: Street Address	City, State, Zip
Business: Street Address	City, State, Zip
Home Phone #	Work Phone #
Cell. #	Fax #

‡ Note: Social Security numbers on application shall not be made public or be considered a part of a public record.

Please indicate below whether you are:

Licensed Elev. Contractor	Licensed Elev. Mechanic	Contractor	Architect	Owner	Mgmt. Co.	Other (please state)
_____	_____	_____	_____	_____	_____	_____

DESCRIBE condition for which alternative is sought 1. physical location of conveyance, (from certificate of inspection) certificate #, State #, manufacturer, date of last inspection; 2. explain problem; be as specific as possible, by location and equipment: e.g., car platform, hoistway wiring, guide rail clearance, suspension system, operating devices, etc.); 3. State why this condition cannot be corrected under currently applicable codes, standards, statutes and regulations. (Use additional space on page 2 if necessary.)

Note: Please Provide Copies of Relevant Documentation in Support of Your Explanation.

EXPLAIN WHY it is necessary to grant an alternative or variance.

CERTIFICATION

I am the applicant submitting this Application for Approved Alternative or Variance under the Conveyance Safety Code. The information contained herein is true and correct. Based upon my own personal knowledge and/or upon information and documentation that I have obtained, I certify that the safety of those riding in or using this conveyance will not be compromised by granting the alternative or variance requested.

_____ _____

Signature Date

_____

Typed or Printed Name (last, first, middle initial)

ADDITIONAL COMMENTS (if necessary)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

The American Society of Mechanical Engineers

AN AMERICAN NATIONAL STANDARD

SAFETY STANDARD FOR CONVEYORS AND RELATED EQUIPMENT

ASME B20.1-1996

(Revision of ASME B20.1-1993)

Addendum G-1

Date of Issuance: May 23, 1997

The 1996 edition of this Standard is being issued with an automatic addenda subscription service. The use of an addenda allows revisions made in response to public review comments or committee actions to be published as necessary; revisions published in addenda will become effective 1 year after the Date of Issuance of the addenda. The next edition of this Standard is scheduled for publication in 1999.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. The interpretations will be included with the above addenda service. Interpretations are not part of the addenda to the Standard.

ASME is the registered trademark of the American Society of Mechanical Engineers.

This code or standard was developed under procedures accredited as meeting the criteria for American National Standards. The Consensus Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment which provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not "approve," "rate," or "endorse" any item, construction, proprietary device, or activity.

ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable Letters Patent, nor assume any such liability. Users of a code or standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations issued in accordance with governing ASME procedures and policies which preclude the issuance of interpretations by individual volunteers.

No part of this document may be reproduced in any form,
in an electronic retrieval system or otherwise,
without the prior written permission of the publisher.

The American Society of Mechanical Engineers
345 East 47th Street New York, NY 10017

Copyright © 1997
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
All Rights Reserved
Printed in U.S.A.

FOREWORD

(This Foreword is not part of ASME B20.1-1996.)

The first edition of the Safety Standard for Conveyors, Cableways, and Related Equipment was sponsored by the National Conservation Bureau and the American Society of Mechanical Engineers. It was approved by the American Standards Association (now known as the American National Standards Institute, Inc.) as American Standard B20.1-1947.

In 1950, the Sectional Committee B20 was reorganized under the sponsorship of the Accident Prevention Department of the Association of Casualty and Surety Companies and the American Society of Mechanical Engineers. Four Subcommittees were formed to make specific recommendations for revisions. These were:

Subcommittee No. 1 — Scope and Intent
Subcommittee No. 2 — Nomenclature and Definitions
Subcommittee No. 3 — Portable Conveyors
Subcommittee No. 4 — Conveyors in General

Section 5, Definitions, was based on the conveyor industry dictionary, Conveyor Terms and Definitions, as prepared by the Technical Committee (now the Engineering Conference) of the Conveyor Equipment Manufacturers Association (CEMA).

The second edition of this Standard, dated April 1955, was submitted in draft form to the Sectional Committee for approval and distributed to industry in general for criticism and comment. Approval was then given by the Sectional Committee, the sponsors, and the American Standards Association. The Standard was designated as American Standard B20.1-1957 on December 4, 1957.

In 1967, the third edition of the Safety Standard for Conveyors and Related Equipment was submitted in draft form to representatives of industry for comment. It was subsequently approved by the Sectional Committee, the sponsors, and the American National Standards Institute for issuance as American National Standard B20.1-1972 on February 17, 1972.

The fourth edition of the Safety Standard for Conveyors and Related Equipment was undertaken in 1973 to assist the Office of Safety and Health Standards, U.S. Department of Labor, which indicated interest in the Standard.

A change in format from a specification standard to a performance standard was deemed necessary. Simply stated, the Standard describes what end result should be achieved without the limiting specification usually given by a design and without the inclusion of finite material selection or dimensions.

The fourth edition was subsequently approved by the B20 American National Standards Committee, the Secretariat, and the American National Standards Institute for issuance as American National Standard B20.1-1976 on June 14, 1976.

In accordance with the policy of the American National Standards Institute, Inc., the B20 Committee began working on a revision of B20.1-1976 in February 1980. The fifth edition was approved by the B20 Committee, the sponsor (ASME), and the American National Standards Institute for issuance as American National Standard B20.1-1984 on March 13, 1984.

Per the procedures outlined and implemented in the fifth edition, the sixth edition was approved by the B20 Committee, the sponsor (ASME), and the American National Standards Institute for issuance as American National Standard B20.1-1987 on March 11, 1987. The

seventh edition was approved for issuance as an American National Standard on March 26, 1990. The eighth edition was approved for issuance as an American National Standard on August 9, 1993.

This ninth edition is a compilation of changes occurring in the 1993 edition, B20.1a-1994, and B20.1b-1995. No new technical changes have been incorporated into the 1996 edition.

Safety standards for mechanical power apparatus are published in ANSI B15.1-1974 (Safety Standard for Mechanical Power Transmission Apparatus). Use of that standard in conjunction with ASME B20.1 is encouraged. Safety standards for lockout and tagout procedures are published in ANSI Z244.1-1982 (American National Standard for Personnel Protection — Lockout/Tagout of Energy Sources — Minimum Safety Requirements) and OSHA Standard Number 29 CFR 1910.147 "The Control of Hazardous Energy (Lockout/Tagout)." Use of these references in conjunction with ASME B20.1 is encouraged.

The values stated within the Standard are in both SI and U.S. customary units, with the latter placed in parentheses. These units are noninterchangeable and, depending on the country, as well as industry preferences, the user will determine which values are to be regarded as the standard.

Safety codes and standards are intended to enhance public safety. Revisions result from committee consideration of factors such as technological advances, new data, and changing environmental and industry needs. Revisions do not imply that previous editions were inadequate.

ASME STANDARDS COMMITTEE B20
Safety Standard for Conveyors and Related Equipment

(The following is a roster of the Committee at the time of publication of this Standard.)

OFFICERS

R. W. Parry, *Chair*
H. L. Krebs, *Vice Chair*
J. Pang, *Secretary*

COMMITTEE PERSONNEL

L. R. Berke, 3M Corp.
A. D. Besel, E.I. du Pont de Nemours & Co., Inc.
J. J. Galante, Autoquip Corporation
A. J. Johnson, Cargill, Inc.
H. L. Krebs, Krebs Engineering
J. E. Maness, Bunge Corp.
R. W. Parry, General Motors Corp.
V. D. Petershack, Hitachi Maxco, Ltd.
R. H. Pfleger, PFLOW Industries, Inc.
W. E. Phillips, Jr., ABP Consulting
R. R. Ridenour, Consultant
F. Salsburg, Eastman Kodak Co.
R. F. Sauger, U.S. Department of Labor — OSHA
D. E. Tonini, Conveyor Equipment Manufacturers Association
T. N. Tyler, Translogic Corp.
B. R. Whitman, Rapistad Demag Corp.

ASME B20.1-1996
SUMMARY OF CHANGES

The 1996 edition contains no new technical changes. The 1996 edition of B20.1 includes all revisions and corrections introduced in B20.1-1993, B20.1a-1994, and B20.1b-1995.

SPECIAL NOTE

The Interpretations to ASME B20.1 are included as a separate section for the user's convenience. This section, however, is not part of the Standard itself.

CONTENTS

Foreword iii
Standards Committee Roster v
Summary of Changes vii

Introduction 1

1 Scope 1

2 Reference to Other Codes 1

3 Intent 1

4 Definitions 2

5 General Safety Standards 7

6 Specific Safety Standards 10

SAFETY STANDARD FOR CONVEYORS AND RELATED EQUIPMENT

INTRODUCTION

Accidents resulting from the manual handling of materials have been reduced by the use of conveying and other forms of mechanical handling equipment. A further reduction in the accident rate can be gained by following safe practices in the design, construction, installation, operation, and maintenance of such equipment.

The design and installation of conveyors and conveyor systems should be supervised by qualifed engineers. Likewise, the operation and maintenance of conveyors and systems should be supervised by trained personnel.

The purpose of this Standard is to present certain guides for the design, construction, installation, operation, and maintenance of conveyors and related equipment.

Those portions of this Standard relating to maintenance and operation procedures are fully as important as those relating to design and installation. The best design features may be negated by faulty maintenance and operating practices. It is important that operating and maintenance personnel be instructed in recognizing hazards and pertinent safety precautions.

1 SCOPE

This Standard applies to the design, construction, installation, maintenance, inspection, and operation of conveyors and conveying systems in relation to hazards. The conveyors may be of the bulk material, package, or unit handling types where the installation is designed for permanent, temporary, or portable operation.

This Standard shall apply, with the exceptions noted below, to all conveyor installations.

This Standard specifically excludes any conveyor designed for, installed for, or used primarily for the movement of human beings. This Standard does, however, apply to certain conveying devices that incorporate within their supporting structure work stations or operator's stations specifically designed for authorized operating personnel.

This Standard does not apply to conveyors such as underground mine conveyors for which specific standards are already in effect, or to equipment such as industrial trucks, tractors, trailers, automatic guided vehicles, tiering machines (except pallet load tierers), cranes, hoists, power shovels, power scoops, bucket drag lines, trenchers, platform elevators designed to carry passengers or an operator, manlifts, moving walks, moving stairways (escalators), highway or railroad vehicles, cableways, tramways, dumbwaiters, pneumatic conveyors, robots, or integral machine transfer devices. Some of the foregoing have specific standards.

The provisions of this Standard shall apply to equipment installed one year after the Date of Issuance.

2 REFERENCE TO OTHER CODES

Certain other codes and standards have been cited as references in this Standard. Reference to them does not constitute inclusion of the complete text of such codes or standards as a part of this Standard.

This Safety Standard for conveyors is supplementary to any law or code covering fire or health regulations.

3 INTENT

The intent of this Standard is to provide for safer operation and maintenance of conveying equipment.

Suggestions for improvement of this Standard may be submitted to the Secretary of the B20 Committee, ASME, 345 East 47th Street, New York, NY 10017.

Proposals should be written in accordance with the following format:

(a) specify page and paragraph designation of the pertinent Standard;

(b) indicate suggested change (addition, deletion, revision, etc.);

(c) briefly state reason and/or evidence for suggested change;

(d) separately submit suggested changes if more than one paragraph is affected.

The B20 Committee will consider each suggested change at its first meeting after receipt of the suggested change(s).

The B20 Committee will render an interpretation of any requirement of the Standard. Interpretations will be rendered only in response to a written request sent

to the Secretary of the B20 Committee, ASME 345 East 47th Street, New York, NY 10017.

The request for interpretation shall be in the following format:

Subject: Cite the applicable paragraph number(s) and provide a concise description.

Edition: Cite the applicable edition of the standard for which the interpretation is being requested.

Question: Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings which are necessary to explain the question; however, they should not contain proprietary names or information.

ASME procedures provide for reconsideration of any interpretation when or if additional information which might affect an interpretation is a available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME committee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

4 DEFINITIONS[1]

actuator: a device that initiates the action of controls or controllers and is manually operated. The actuator may be a push button, toggle switch, foot pedal, hand lever, hand set timer, or any other device that performs the described function.

antirunaway: a safety device to stop a declining conveyor and thus prevent moving away in the event of a mechanical or electrical failure

apron pan: one of a series of overlapping or interlocking plates or shapes that, together with others, forms the conveyor bed

automatically controlled: describes the operation by the action of a mechanism that is initiated by some impersonal influence, such as a conveyor that is started by a low level bin indicator

backstop: a mechanical device to prevent reversal of a loaded conveyor under action of gravity when forward travel is interrupted

bed:

(a) that part of a conveyor upon which the load or carrying medium rests or slides while being conveyed

(b) in bulk material conveyors, the mass of material being conveyed

belt idler: a roller or series of rollers that supports the belt of a belt conveyor

belt tripper: a device incorporating a system of pulleys that causes the conveyor belt to discharge material at one or more points along the length of the conveyor

boom: a cantilevered member or structure that may be hinged, fixed, or pivoted

brake: a friction device for slowing down conveyor components, bringing conveyor equipment to a controlled stop, holding traveling or traversing equipment in a selected location, preventing reverse travel, and controlling overspeed due to the action of gravity

bunker: a large bin or compartment for the storage of bulk materials

car unloader: a type of conveyor characterized by a shallow, horizontal loading section which enables it to receive and unload material from hopper bottom cars without requiring a pit or other excavation

carrier:

(a) a device attached to or hung from trolleys to support the load

(b) the receptacle in which objects are placed for transmittal through a conveying system

(c) the moving part of a vertical or inclined reciprocating conveyor that supports the load

chain: a series of links pivotally joined together to form a medium for conveying or transmitting motion or power. General classes of chain common to conveyors are detachable, pintle, combination, roller, rivetless, coil, inverted tooth, and bar link chains.

chute: a trough through which bulk materials or objects are directed and lowered by gravity. The trough may be open or enclosed, straight or curved.

control: the system governing the starting, stopping, direction of motion, acceleration, speed, retardation, identification, and function of the moving member in a predetermined manner

[1] Many definitions were extracted from the latest revision of Conveyor Terms and Definitions, Book No. 102, prepared by the Engineering Conference of the Conveyor Equipment Manufacturers Association, Washington, D.C. 20850. For definitions of terms other than those defined in Section 4, refer to this publication.

controller: an electromechanical device or assembly of devices for starting, stopping, accelerating, or decelerating a drive, or serving to govern in some predetermined manner the power delivered to the drive

conveying medium: that portion of a conveyor that moves or carries materials, packages, or objects

conveyor: a horizontal, inclined, or vertical device for moving or transporting bulk material, packages, or objects, in a path predetermined by the design of the device, and having points of loading and discharge, fixed or selective. Included are skip hoists, and vertical reciprocating an inclined reciprocating conveyors. Typical exceptions are those devices known as industrial trucks, tractors, trailers, tiering machines (except pallet load tierers), cranes, hoists, power shovels, power scoops, bucket drag lines, trenchers, platform elevators designed to carry passengers or an operator, manlifts, moving walks, moving stairways (escalators), highway or railway vehicles, cableways, tramways, dumbwaiters, pneumatic conveyors, robots, or integral machine transfer devices.

conveyor belt: a belt used to carry materials and transmit the power required to move the load being conveyed

conveyor screw: the material propelling medium of a screw conveyor generally consisting of an assembly of helical flights mounted on a rotating pipe or shaft

conveyor, apron: a conveyor in which a series of apron pans forms a moving bed

conveyor, belt: an endless fabric, rubber, plastic, leather, or metal belt operating over suitable drive, tail end, and bend terminals and over belt idlers or slider bed for handling bulk materials, packages, or objects placed directly upon the belt

conveyor, bucket: any type of conveyor in which the material is carried in a series of buckets

conveyor, chain: any type of conveyor in which one or more chains act as the conveying medium; a British term for trolley conveyor

conveyor, declining: a conveyor transporting down a slope

conveyor, electrified monorail: a conveyor consisting of a network of tracks or guide rails that may be installed horizontally, vertically, inclined, or in combination, with one or more self-propelled cars or trolleys that move independently under automatic control from one point to another within the track network, carrying material in containers or by devices suspended from or attached to the cars or trolleys

conveyor, en masse: a conveyor, comprised of a series of skeleton or solid flights on an endless chain or other linkage, that operates in horizontal, inclined, or vertical paths within a closely fitted casing for the carrying run. Bulk material is conveyed and elevated in a substantially continuous stream with a full cross section of the casing.

conveyor, extendable: a conveyor that may be lengthened or shortened to suit operating needs

conveyor, flight: a type of conveyor comprised of one or more endless propelling media, such as chain, to which flights are attached, and a trough through which material is pushed by the flights

conveyor, horizontal reciprocating: a conveyor that progressively advances material by a back and forth motion of its conveying medium. It may be equipped with hinged flights or tilting dogs or pushers. These units operate generally in the range of 0 deg. to 30 deg. from the horizontal.

conveyor, inclined reciprocating: a reciprocating power or gravity actuated unit (not designed to carry passengers or an operator) that receives objects on a carrier. These units operate on inclines generally in the range of 30 deg. to 70 deg. from the horizontal.

conveyor, live roller: a series of rollers over which objects are moved by the application of power to all or some of the rollers. The power transmitting medium is usually belting or chain.

conveyor, mobile: conveyor, supported on a structure, which is movable under its own power and includes, but is not limited to, radial stackers, winged stackers, reclaiming conveyors, and shiploaders. These conveyors normally handle bulk material.

conveyor, oscillating: a type of vibrating conveyor having a relatively low frequency and large amplitude of motion, usually powered by a rotating eccentric

conveyor, overland: a single or series of belt conveyors designed to carry bulk material across country, usually following the general contour of the land

conveyor, portable: a transportable conveyor which is not self-propelled, usually having supports that provide mobility

conveyor, power and free: a conveying system wherein the load is carried on a trolley or trolleys that is mechanically propelled through part of the system and

may be gravity or manually propelled through another part. This arrangement provides a means of switching the free trolleys into and out of adjacent lines. The spur or subsidiary lines may or may not be powered.

conveyor, pusher bar: two endless chains cross-connected at intervals by bars or rotatable pushers that propel the load along the bed or trough of the conveyor

conveyor, reciprocating: a conveyor where the carrier or pusher moves forward and back, or up and down, in the same plane

conveyor, roller: a series of rollers supported in a frame over which objects are advanced manually, by gravity, or by power

conveyor, roller slat: a slat conveyor using rollers for slats

conveyor, screw: a conveyor screw revolving in a suitably shaped stationary trough or casing fitted with hangers, trough ends, and other auxiliary accessories

conveyor, shuttle: any conveyor such as a belt, chain, apron, screw, etc., in a self-contained structure, movable in a defined path parallel to the flow of the material

conveyor, slat: a conveyor employing one or more endless chains to which non-overlapping, non-interlocking spaced slats are attached

conveyor, suspended tray: a vertical conveyor, having one or more endless chains with suitable pendant trays, cars, or carriers, that receives objects at one elevation and delivers them to another elevation

conveyor, tow: an endless chain supported by trolleys from an overhead track or running in a track at the floor with means for towing floor supported trucks, dollies, or carts

conveyor, trolley: a series of trolleys supported from or within an overhead track and connected by endless propelling means, such as chain, cable, or other linkage, with loads usually suspended from the trolleys

conveyor, vertical articulated: a type of vertical conveyor in which sections of articulated slat conveyor apron form rigid carriers for vertical movement in continuous flow. The carriers are flexible in but one direction, and they assume a vertical position on the noncarrying run to minimize space requirements.

conveyor, vertical chain, opposed shelf type: two or more vertical elevating-conveying units opposed to each other. Each unit consists of one or more endless chains whose adjacent facing runs operate in parallel paths. Thus each pair of opposing shelves or brackets receives objects (usually dish trays) and delivers them to any number of stations.

conveyor, vertical reciprocating: a reciprocating power or gravity actuated unit (not designed to carry passengers or an operator) that receives objects on a carrier and transmits these objects vertically between two or more levels

conveyor, vibrating: a trough, tube, or other device flexibly supported and vibrated at a relatively high frequency and small amplitude to convey bulk material or objects; usually powered by an electrical or pneumatic impulse

conveyor, wheel: a series of wheels supported in a frame over which objects are moved manually or by gravity

deflector:

(a) a device across the path of a conveyor placed at an angle and designed to deflect objects

(b) a plate inserted in the trajectory of a bulk material discharge to change direction

drive: an assembly of the necessary structural, mechanical, and electrical parts that provide the motive power for a conveyor

drum: a cylindrical or polygonal rim type of wheel around which cable, chain, belt, or other linkage may be wrapped. A drum may be drive or driving. The face may be smooth, grooved, fluted, or flanged.

dumbwaiter: a type of material lifting device specifically limited to a platform area of 9 ft^2 (0.8 m^2) or less, an inside car height of 4 ft (1.2 m) or less, and a hoistway door height of 4 ft 1 in. (1.24 m) or less[2]

emergency stop: a stop arising from a sudden and unexpected need, and not as a part of the normal operation

emergency stop device: a device that can be actuated in an emergency situation to stop a conveyor

enclosed: describes guarding of moving parts in such a manner that inadvertent physical contact by parts of the body is precluded as long as the guard or enclosure remains in place. The guarding may make use of hinged, sliding, or removable doors for inspection or service.

[2] See ASME A17.1 for dumbwaiter safety requirements.

flight:

(a) plain or shaped plates suitably made for attachment to the propelling medium of a flight conveyor

(b) a term applied to any section of a conveyor in a tandem series

gate: a device or structure by means of which the flow of material may be stopped or regulated; also, a section of conveyor equipped with a hinge mechanism for movable service, often called a hinged section

grating:

(a) a coarse screen made of parallel or crossed bars to prevent passage of oversize material

(b) a series of parallel and crossed bars used as platform or walkway floors, or as coverings for pits and trenches over which traffic may pass. Generally removable to permit access to conveying equipment for servicing.

(c) a series of parallel or cross bar units, or both, fastened to or propelled by the conveying medium, used for carrying large lump-sized bulk material or objects. Usually used to permit passage of air for cooling or heat to maintain temperature.

guard:

(a) a covering, barricade, grating, fence, or other form of barrier used to prevent inadvertent physical contact with operating components such as gears, sprockets, chains, and belts

(b) a structure mounted below an overhead mounted conveyor to protect personnel from falling materials

guarded: shielded, fenced, enclosed, or otherwise protected by means of suitable enclosure, covers, casing, shields, troughs, railings, or by nature of location so as to reduce risk of personal injury

guarded by location: describes moving parts so protected by their remoteness from the floor, platform, walkway, or other working level, or by their location with reference to frame, foundation, or structure as to reduce risk of accidental contact by persons or objects. Remoteness from regular or frequent presence of public or employed personnel may in reasonable circumstances constitute guarding by location.

hopper: a box having a funnel-shaped bottom, or a bottom reduced in size, narrowed, or necked to receive material and direct it to a conveyor, feeder, or chute

inactive controls: those controls that are not a part of or do not contribute to the present or future contemplated use of the conveyor or system, as presently installed and wired

integral machine transfer device: a part of a machine that loads, unloads, or transfers material (parts) from one location to another within the machine, during processing of the material, and without which the machine could not perform its function. Typically, both the machine and transfer device are supplied together, an share the power and control systems.

limit switch: an electrical device by which the movement of a conveyor and allied equipment may be controlled within predetermined limits

nip point: a point at which a machine element moving in line meets a rotating element in such a manner that it is possible to nip, pinch, squeeze, or entrap a person or objects coming into contact with one of the two members. The same definition holds for the similar point with respect to two rotating parts or two converging parts in linear movement.

operator's station: location at which actuators are placed for the purpose of starting, stopping, reversing, or otherwise controlling the conveyor or system of conveyors in the course of normal operation

overload device: a mechanical or electrical device designed to disconnect the driven equipment from the driving equipment in event of an overload on the conveyor

platform: a working space for persons, elevated above the surrounding floor or ground (such as a balcony) for the operation of machinery and equipment

prevent: when used in a context such as prevent access or prevent physical contact, means to impede or block; when used in a context such as prevent injury, means to reduce the chances of, but does not imply that an injury cannot occur

qualified person: a person who, by possession of a recognized degree or certificate of professional standing, or who, by extensive knowledge, training, and experience has successfully demonstrated his ability to solve problems relating to the subject matter and work

rail:

(a) one of the longitudinal members in a conveyor frame

(b) the supporting surface under the wheels or rollers of a chain conveyor

(c) the supporting track for equipment mounted on wheels, such as belt tripper, weigh larry, etc.

(d) the vertical members that guide the pendant trays, cars, or carriers in a suspended vertical tray conveyor

rail clamp: an attachment or device for clamping a mobile conveyor or belt tripper to the rail to hold it in a fixed location

rail stop: a stop mounted on the conveyor rails to limit the travel of traversing machinery

railing guard: a structure consisting of rails and posts, including top rail, center rail, posts, and, where required, toeboards

rated capacity: the capacity at the rated speed, as established by the manufacturer or a qualified person, at which safe and satisfactory service can be expected

rated speed: the speed of the conveyor, as established by the manufacturer or a qualified person, at which safe and satisfactory service can be expected

remote control: any system of controls in which the actuator is situated in a remote location

remote location: any location, with respect to the conveyor, from which the presence or position of personnel relative to the conveyor cannot be readily determined from the operator's station

roller:

(a) a revolving cylinder or wheel over which something is moved. The face may be straight, tapered, crowned, concave, or flanged; corrugated, ribbed, or fluted

(b) a component part of a roller chain in which it may serve only to reduce frictional loss occurring as the chain passes over the sprockets. Rollers may also serve as the rolling support for the chain and the load being conveyed

(c) the rotating element upon which a conveyor belt or chain or the object being transported is carried

roller turn: a series of vertical rollers mounted in a frame to guide conveyor chain around a horizontal curve

safety device: a mechanism or an arrangement placed in use for the specific purposes of preventing an unsafe condition, preventing the continuation of an unsafe condition, warning of an unsafe condition, or limiting or eliminating the unsafe effects of a possible condition

shall: as used in the context of a provision of this Standard, indicates that the provision is mandatory and must be followed

shear point or line: the point at which, or the line along which, a moving part meets or passes close enough to a stationary or moving part or object so that part of the human body can be caught, trapped, or pinched between them

shield guard: a full or partial enclosure or cover, either framed or solid, made from material sufficiently rigid to prevent accidental contact with moving parts

should: as used in the context of a provision of this Standard, indicates a recommendation, the advisability of which depends on the facts in a particular situation

skip bucket: the tub or bucket used for containing the material conveyed by a skip hoist

skip hoist: a bucket or car operating up and down a defined path receiving, elevating, and discharging bulk materials

slat: a member supported between chains in a slat conveyor; the series of slats form the conveying medium

snub roller: any pulley used to increase the arc contact between a belt and drive or trail pulley

spill guard: a stationary device of sufficient strength and capacity to catch, retain, and contain any reasonably foreseeable spillage from a conveyor passing overhead that might cause personal injury

stacker: a conveyor adapted to piling or stacking bulk materials, packages, or objects

switch

(a) a device for connecting two or more continuous package conveyor lines

(b) an electrical control device

(c) a mechanism that transfers a trolley, carrier, or truck from one track to another at a converging or diverging section

switch, slack cable: a device installed to automatically shut off the power supply when the hoisting cable becomes slack or has slack due to accident or jamming

take-up: the assembly of the necessary structural and mechanical parts that provides the means to adjust the length of belts, cables, chains, etc., to compensate for stretch, shrinkage, or wear, and to maintain proper tension

terminal: a term normally applied to the extreme ends of a belt system, i.e., head and tail pulleys

tow pin: a movable or fixed member on a truck, dolly, or cart used to engage a pushing or pulling dog on a floor mounted tow conveyor

tracks: the beams, shapes, or formed section on which trolleys, rollers, shoes, or wheels roll or slide while being propelled

transfer car: any wheeled device used for transferring loads from one conveyor line to another; may be manually or automatically operated

transfer mechanism: any mechanism that transfers objects onto or off a conveyor line or from one conveyor line to another

tray: a car, carrier, or pallet, usually suspended from the moving element of the conveyor, used to carry conveyed loads

tread plate: a plate of suitable size fitted between conveyor rollers to permit persons to use it as a working or walking surface

trolley: an assembly of wheels, bearings, and brackets used for supporting and moving suspended loads or for carrying load connecting and conveying elements such as chain, cable, or other linkage

truck (also known as cart)

(a) an assembly that supports another unit in either a fixed or adjustable position and that provides mobility

(b) a wheeled vehicle that can be detached from a conveying medium (usually chain) and pushed by hand

walkway: an elevated passageway for persons above the surrounding floor or ground level, including catwalks, footwalks, runways, and elevated walkways

work station: a physical location where a person is normally positioned which is located by design and supported with facilities necessary for a person to perform prescribed work duties. This position would not apply to maintenance location.

5 GENERAL SAFETY STANDARDS

5.1 Application

Conveyor equipment shall be used to convey only the specified commodities or materials within the rated capacity and the rated speed. Where special use is not indicated, or ratings are not available, good industry practice shall be used.

5.2 Maintenance (Repair)

(a) Maintenance and service shall be performed by qualified and trained personnel.

(b) Where lack of maintenance and service would cause a hazardous condition, the user shall establish a maintenance program to ensure that conveyor components are maintained in a condition that does not constitute a hazard to personnel.

(c) No maintenance or service shall be performed when a conveyor is in operation except as provided in paras. 5.3 and 5.4.

(d) When a conveyor is stopped for maintenance or service, the starting devices, prime movers, or powered accessories shall be locked or tagged out in accordance with a formalized procedure designed to protect all persons or groups involved with the conveyor against an unexpected restart. Personnel should be alerted to the hazard of stored energy, which may exist after the power source is locked out. Refer to ANSI Z244.1-1982, American National Standard for Personnel Protection — Lockout/Tagout of Energy Sources — Minimum Safety Requirements, and OSHA Standard 29 CFR 1910.147, "The Control of Hazardous Energy (Lockout/Tagout)."

(e) All safety devices and guards shall be replaced before starting equipment for normal operation.

5.3 Lubrication

(a) Conveyors shall not be lubricated while in operation unless it is impractical to shut them down for lubrication. Only trained and qualified personnel who are aware of the hazards of the conveyor in motion shall be allowed to lubricate a conveyor that is operating.

(b) Where the drip of lubricants or process liquids on the floor constitutes a hazard, drip pans, or other means of eliminating the hazard shall be provided.

5.4 Adjustment or Maintenance During Operation

When adjustment or maintenance must be done while equipment is in operation, only trained and qualified personnel who are aware of the hazard of the conveyor in motion shall be allowed to make adjustment or perform the maintenance or service.

5.5 Backstops and Brakes

Antirunaway, brake, or backstop devices shall be provided on all incline, decline, or vertical conveyors, where the effect of gravity will allow uncontrolled lowering of the load and where this load will cause a hazard to personnel.

5.6 Overload Protection

Where overload conditions would cause damage to equipment that could result in a personal injury, overload devices or suitable warning means shall be provided.

5.7 Gates and Switches

(a) Power positioned gate and switch sections shall be provided with devices that will prevent these sections from falling in case of power failure.

(b) Means shall be provided on all gate and switch sections to prevent conveyed material from discharging into the open area, created by lifting of the gate or switch.

5.8 Counterweights

When counterweights are supported by belts, cables, chains, and similar means, weights shall be confined in an enclosure to prevent the presence of personnel beneath the counterweight. As an alternative the arrangement shall provide a means to restrain the falling weight in case of failure of the normal counterweight support.

5.9 Guards and Guarding

5.9.1 General Requirements of Guarding

5.9.1.1 Guarding. Where necessary for the protection of personnel from hazards, all exposed moving machinery parts that present a hazard to personnel at work stations or operator's stations shall be mechanically or electrically guarded, or guarded by location or position.

5.9.1.2 Interfacing of Equipment. When two or more pieces of equipment are interfaced, special attention shall be given to the interfaced area to ensure the presence of adequate guarding and safety devices.

5.9.1.3 Guarding Exceptions. Wherever conditions prevail that would require guarding under this Standard but such guarding would render the conveyor unusable, prominent warning means, such as signs or warning lights, shall be provided in the area or on the equipment in lieu of guarding.

5.9.1.4 Maintenance of Guards and Safety Devices. Guards and safety devices shall be maintained in a serviceable condition. Warnings provided in accordance with para. 5.9.1.3 shall be maintained in a legible/operational condition.

5.9.2 Guarding by Location or Position

(a) Remoteness from frequent presence of public or employed personnel shall constitute guarding by location.

(b) Overhead conveyors, such as trolley conveyors and hanger suspended tray conveyors, for which guarding would render the conveyor unusable or would be impracticable, shall have prominent and legible warnings posted in the area or on the equipment, and, where feasible, lines shall be painted on the floor delineating the danger area.

(c) When a conveyor passes over a walkway, roadway, or work station, it is considered guarded by location if all moving parts are at least 2.44 m (8 ft) above the floor or walking surface or are otherwise located so that personnel cannot inadvertently come in contact with hazardous moving parts.

(d) Although overhead conveyors may be guarded by location, spill guards, pan guards, or equivalent shall be provided if material may fall off the conveyor and endanger personnel.

5.9.3 Guarding of Nip and Shear Points. In general, nip and shear points shall be guarded unless other means to assure safety are provided. See Section 6 for specific conveyors.

5.10 Headroom

(a) When conveyors are installed above exit passageways, aisles, or corridors, there shall be provided a minimum clearance of 2.00 m (6 ft 8 in.) measured vertically from the floor or walking surface to the lowest part of the conveyor or guards.

(b) Where system function will be impaired by providing the minimum clearance of 2.00 m (6 ft 8 in.) through an emergency exit, alternate passageways shall be provided.

(c) It is permissible to allow passage under conveyors with less than 2.00 m (6 ft 8 in.) clearance from the floor for other than emergency exits if a suitable warning indicates low headroom.

5.11 Controls

5.11.1 Electrical Code. All electrical installations and wiring shall conform to the National Electrical Code (Article 670 and other applicable articles) as published by the National Fire Protection Association and as approved by the American National Standards Institute, Inc.

5.11.2 Control Station

(a) Control stations should be so arranged and located that the operation of the affected equipment is visible from them. Control stations shall be clearly marked or labeled to indicate the function controlled.

(b) A conveyor that would cause injury when started shall not be started until personnel in the area are alerted by a signal or by a designated person that the conveyor is about to start.

(1) When a conveyor that would cause injury when started is automatically controlled or must be

controlled from a remote location, an audible device or devices shall be provided that can be clearly heard at all hazardous points along the conveyor where personnel may be present. The audible warning shall be actuated by the controller device starting the conveyor and shall continue for a required period of time before the conveyor starts. A flashing light or similar visual warning may be used in conjunction with, or in place of, the audible device if a visual warning is more effective.

(2) Where system function would be seriously hindered or adversely affected by the required time delay, or where the intent of the warning may be misinterpreted (i.e., a work area with many different conveyors and allied devices), a clear, concise, and legible warning sign shall be provided. The warning sign shall indicate that conveyors and allied equipment my be started at any time, that danger exists, and that personnel must keep clear. These warning signs shall be provided along the conveyor at areas not guarded by position or location.

(c) Remotely and automatically controlled conveyors, and conveyors where operator stations are not manned or are beyond voice or visual contact from drive areas, loading areas, transfer points, and other potentially hazardous locations on the conveyor path not guarded by location, position, or guards, shall be furnished with emergency stop buttons, pull cords, limit switches, or similar emergency stop devices.

(1) All such emergency stop devices shall be easily identifiable in the immediate vicinity of such locations unless guarded by location, position, or guards. Where the design, function, and operation of such conveyor clearly is not hazardous to personnel, an emergency stop device is not required.

(2) the emergency stop device shall act directly on the control of the conveyor concerned and shall not depend on the stopping of any other equipment. The emergency stop devices shall be installed so that they cannot be overridden from other locations.

(d) Inactive and unused actuators, controllers, and wiring should be removed from control stations and panel boards, together with obsolete diagrams, indicators, control labels, and other material that might confuse the operator.

5.11.3 Safety Devices. All safety devices, including wiring of electrical safety devices, shall be arranged to operate such that a power failure or failure of the device itself will not result in a hazardous condition.

5.11.4 Emergency Stops and Restarts. Conveyor controls shall be so arranged that, in case of emergency stop, manual reset or start at the location where the emergency stop was initiated shall be required for the conveyor(s) and associated equipment to resume operation.

Before restarting a conveyor that has been stopped because of an emergency, an inspection of the conveyor shall be made and the cause of the stoppage determined. The starting device shall be locked or tagged out before any attempt is made to remove the cause of the stoppage, unless operation is necessary to determine the cause or to safely remove the stoppage. Refer to ANSI Z244.1-1982, American National Standard for Personnel Protection — Lockout/Tagout of Energy Sources — Minimum Safety Requirements, and OSHA Standard Number 29 CFR 1910.147 "The Control of Hazardous Energy (Lockout/Tagout)."

5.12 Operation

(a) Only a trained person shall be permitted to operate a conveyor. Training shall include instruction in operation under normal conditions and emergency situations.

(b) Where safety is dependent upon stopping devices or starting devices or both, they shall be kept free of obstructions to permit ready access.

(c) The area around loading and unloading points shall be kept clear of obstructions that could endanger personnel.

(d) No person shall ride on a conveyor, except on a slow moving assembly conveyor 0.4 m/s (80 ft/min) maximum or on a conveyor that incorporates a station specifically designed for operating personnel.

(e) Personnel working on or near a conveyor shall be instructed as to the location and operation of pertinent stopping devices.

(f) A conveyor shall be used to transport only loads it is designed to handle safely.

(g) Under no circumstances shall the safety characteristics of the conveyor be altered if such alterations would endanger personnel.

(h) Routine inspections and corrective maintenance measures shall be conducted to ensure that all guards and safety features are retained and function properly.

(i) Personnel should be alerted to the potential hazard of entanglement in conveyors caused by items such as long hair, loose clothing, and jewelry.

(j) Conveyors shall not be maintained or serviced while in operation unless proper maintenance or service requires the conveyor to be in motion. In which case, personnel shall be made aware of the hazards and how the task may be safely accomplished.

5.13 Transfer, Loading, and Discharge Points

(a) At transfer, loading, and discharge points where unconfined and uncontrolled free fall of material can result from flooding, ricocheting, overloading, trajectory, leakage, or a combination thereof, such unconfined and uncontrolled free fall of material shall be prevented if it would create a hazard to personnel.

(b) In the absence of a guard or barrier specifically erected to protect personnel, warnings shall be provided to restrict unauthorized personnel from entering hazardous loading, unloading, and transfer areas.

5.14 Hoppers and Chutes

(a) All openings to hoppers and chutes shall be guarded to prevent personnel from accidentally falling or stepping into them or allowing any part of their body to make contact with conveyors below them. Where guards are not practical, warning signs shall be posted. If the hopper or chute is equipped with a grating to protect against contacting the conveyors below, such grating will be considered as sufficient guarding provided that one dimension of the opening does not exceed 50 mm (2 in.).

(b) Dump hoppers having the hopper flush with the floor and which by their use cannot be guarded shall be equipped with grating having a maximum opening of 50 mm (2 in.) and shall be heavy enough to withstand any load of personnel or trucks, etc., that may be imposed on it. If the openings in the grating are larger or if no grating is provided, temporary railing guard shall be placed around ground level hoppers when dumping operations are not in progress. During dumping operations, warning signs shall be placed in conspicuous locations warning personnel of an open pit. If there is a need to give operators of trucks, loaders, or bulldozers a reference to the hopper location, guide posts shall be used.

5.15 Fire Safety

This Standard is not intended to address fire-related considerations. Applicable national, state, and local codes should be complied with.

6 SPECIFIC SAFETY STANDARDS

6.1 Belt Conveyors — Fixed in Place

6.1.1 Safety Considerations

(a) Nip and shear points shall be guarded. Typical locations are:

(1) at terminals, drives, take-ups, pulleys, and snub rollers where the belt changes direction;

(2) where belts wrap around pulleys;

(3) at the discharge end of a belt conveyor;

(4) on transfers and deflectors used with belt conveyors;

(5) at take-ups

(b) It is not the intent of this requirement to provide guarding along the conveyor length where the belt rides on the carrying or return rollers.

(c) Take-up mechanisms may be guarded as an entity by placing standard railings or fencing around the area with suitable warning signs, as an alternative to guarding individual nip and shear points.

(d) On overland conveyors, audible or visual (or both), signalling devices for warning conveyor initiation shall be required only at the transfer, loading, and discharge points, or at those points where personnel are normally stationed.

(e) On long overland belt conveyors where a pedestrian overpass or underpass is required, they shall be installed at intervals consistent with usage, normally not to exceed 300 m (1000 ft).

6.1.2 Operation and Maintenance

(a) Only trained personnel shall track a conveyor belt, which must be done while the conveyor is operating.

(b) The practice of applying a belt dressing or other foreign material to a rotating drive pulley or a conveyor belt is hazardous and should be avoided.

(c) The use of portable emergency stop controllers in lieu of permanently installed pull cords, push button stations, etc., shall be permitted for maintenance personnel who patrol overland conveyors. At those points where personnel are normally stationed, the conveyors shall be equipped with permanently installed pull cords or similar stop controllers.

6.2 Bucket Conveyors

6.2.1 Guarding

(a) Guards shall be provided at points where personnel could come in contact with cables, chains, belts, and runways of exposed bucket conveyors.

(b) Inspection doors or maintenance doors or both should include signs warning of possible danger if opened or removed while the conveyor is in operation.

6.3 Chain Conveyors

6.3.1 Safety Considerations

(a) Chain conveyors, by necessity, have moving chains that cannot be enclosed without impairing the function. They shall be provided with warning signs or personnel barriers, unless guarded by location.

IMPORTANT: The general safety standards in Section 5 form a part of and must be used with the specific standards in Section 6.

(b) Where a chain conveyor is raised and lowered as a transfer mechanism, mounted within another conveyor, and where enclosure would impair the function, warning signs or personnel barriers shall be provided, unless guarded by location.

6.4 En Masse Conveyors

6.4.1 Safety Considerations. En masse conveyors are not considered as free standing and are to be braced at intervals indicated by the manufacturer. Eccentric platform loads or other lateral loads may require lateral bracing or other bracing or both.

6.4.2 Guarding. Inspection doors or maintenance doors or both should include signs warning of possible danger if opened or removed while conveyor is in operation.

6.4.3 Operation and Maintenance

(a) Where flight cleaning or casing cleaning or both are required, they shall be performed by trained personnel with conveyor power supply locked out. Special attention may be required at feed and discharge points.

(b) When coupling or uncoupling the en masse conveyor line, the line shall be restrained to prevent injury through the uncontrolled travel of the broken line.

6.5 Flight and Apron Conveyors — Bulk Material

6.5.1 Safety Considerations. Inclined apron conveyors shall be equipped with lifting blades when the conveyor inclination exceeds the angle of slide of the design material.

6.5.2 Operation and Maintenance. At installation, flight and apron conveyors should be "jogged" or hand run through at least one complete revolution to check design clearances prior to running under automatic power.

Flight and apron conveyors handling sticky materials, which tend to build up, shall be cleaned as often as required for safe operation.

6.6 Inclined Reciprocating Conveyors

6.6.1 Safety Considerations

(a) Means shall be provided to prevent hazard to personnel in the event of mechanical or electrical failure. The carrier must be equipped with backstop devices sufficient to stop and to hold the carrier and load.

(b) Overtravel devices shall be provided where necessary to minimize potential for injury to personnel.

(c) Riding the conveyor shall be forbidden to all personnel. Warning signs to this effect shall be prominently posted at each point of access and each point of operation.

6.6.2 Guarding

(a) The conveyor shall be guarded so as to prevent injury from inadvertent physical contact.

(b) The conveyor housing should be equipped with doors or an equivalent device at each manual loading and unloading station, interlocked so that they can be opened only when the carrier has stopped at that level and such that the carrier cannot be actuated until they are closed. This requirement is mandatory where solid doors prevent the user from seeing the carrier.

(c) Inclined reciprocating conveyors that automatically receive and discharge material may have interlocked doors as in (b) above or, as an alternative, may be guarded by a suitable enclosure extending from the path of the moving carrier.

(d) Where the application requires that personnel walk onto the carrier to load or unload material, the carrier shall be provided with standard railings, snap chains, or equivalent, across the loading/unloading side(s). Snap chains shall be at least 39 in. at their lowest point.

(e) Controls shall be installed or located so they cannot be actuated by a person on the carrier.

6.7 Live Roller Conveyors — Belt or Chain Driven

6.7.1 Safety Considerations

(a) Nip points occur between chain and sprockets on chain driven live roller conveyors.

(b) Nip points can occur between belt and carrier rollers on belt driven live roller conveyors.

(c) Nip points occur at terminals, drives, take-ups, idlers, and snub rollers where the belt changes direction. A return belt idler does not require guarding.

(d) Nip points occur on transfers and deflectors used with live roller conveyors.

(e) Shear points occur at automatic take-ups; they shall be guarded.

6.7.2 Guarding

(a) On chain driven live rollers, in addition to covering the top of the sprockets, the guard shall extend downward to obstruct entrance from the side and from

---

IMPORTANT: The general safety standards in Section 5 form a part of and must be used with the specific standards in Section 6.

below, or the underside shall be covered, unless guarded by location or position.

(b) On belt driven live roller conveyors, nip points between the belt and roller may be considered guarded if the load carrying rollers are spaced so as to prevent access, if plates or rods are placed between rollers, if pop-out rollers are used as load carrying rollers, or if other suitable guarding is used, such as guarding by location.

6.8 Mobile Conveyors

6.8.1 Safety Considerations

(a) Mobile conveyors shall be provided with a brake, rail clamp, or other position locking device for each motion, such as, but not limited to, luffing, slewing, and traversing, where movement would present a hazard.

(b) Limit switches shall be provided on rail mounted mobile conveyors to limit the travel within design limits. Rail stops shall be provided beyond the design travel limits to physically stop the mobile conveyor in case of overtravel.

(c) Sweeps shall be provided on all rail mounted mobile conveyors to deflect objects ahead of the nip points between wheels and rails where a hazard to personnel would result without the sweep.

(d) A mobile conveyor shall be designed to be stable against runaway or overturning under normal conditions of operation. Resting a portion of a mobile conveyor on the ground, a pile, or on any other support shall not cause instability of the machine.

6.8.2 Guarding

(a) Where power to electrically powered mobile conveyors is provided by trolley or rail, these conductors shall be guarded in such a manner as to prevent accidental contact by personnel.

(b) Access stairways, ladders, and platforms shall be designed and located so as to avoid hazardous shear or nip points between sections of structures that in operation move relative to each other.

6.8.3 Operation and Maintenance

(a) When a mobile conveyor exposed to high wind conditions creates a hazard to personnel, normal operation shall cease and, if necessary, the conveyor shall be moved to a parking position and secured.

(b) When an operator is required on a mobile conveyor, a platform or cab shall be constructed for his protection. The conveyor shall be designed so that, when the operator is on the platform engaged in the normal performance of his duties, he will be protected from injury.

(c) Where operation is such that there is danger of movement of the mobile conveyor into the stockpile or any other obstacle, a detector shall be provided to stop the conveyor movement.

6.9 Portable Conveyors, Extendible Belt Conveyors, and Car Unloaders

6.9.1 Safety Considerations

(a) The raising and lowering mechanism for the boom of a portable conveyor shall include in its design, or be provided with, a safety device that will hold the boom at any rated angle of inclination.

(b) A powered extendible conveyor shall be equipped with a device located on the outermost boom end that shall stop extension of the conveyor when contact is made with the device as may be required to protect personnel.

(c) An extendible conveyor shall be equipped with momentary contact push buttons without holding circuits to activate powered booms.

(d) Portable conveyors shall be stable when used within the manufacturer's rating so that the conveyor will not topple when in use or when being moved in the manner for which it was intended. When the portable conveyor must be lashed to prevent movement or overturning in high winds, a warning sign indicating the necessity shall be clearly posted.

(e) Guarding by location shall be determined with the boom in its lowest position.

6.10 Pusher Bar Conveyors

6.10.1 Safety Considerations

(a) If a hazard exists where the bar passes through the bed at the discharge end, suitable guards or warnings shall be provided at this point.

(b) Loads on the incline shall have pushers of adequate height above the bed or have top restraining members.

(c) All chains shall be guarded by suitable means, including warning signs, to prevent accidental contact with the moving chain.

(d) In a pusher bar conveyor having a roller bed, where the relationship between the height of the bar and the spacing of the rollers creates a hazard, adequate guarding shall be provided.

(e) When a shear point exists between the return pusher bar and a frame member, guarding shall be provided.

IMPORTANT: The general safety standards in Section 5 form a part of and must be used with the specific standards in Section 6.

(f) When the conveyor is automatically loaded, an automatic spacer shall be provided to ensure feeding the loads ahead of the pusher bars where a hazard to personnel could exist.

(g) When a pusher bar conveyor discharges to another conveyor, means shall be provided to stop the pusher bar conveyor in the event the receiving conveyor cannot accept another load.

6.11 Roller and Wheel Conveyors

6.11.1 Safety Considerations

(a) Unit or package speeds that could create a safety hazard shall be avoided by limiting the length of the pitched run or by using speed retarders, brakes, or other means which effectively provide the control needed.

(b) Personnel shall not be allowed to walk or step on free turning rollers or wheels. Suitable means such as tread plates can be used between the rollers as a walking surface for designated operators in the performance of their duties.

6.11.2 Operation and Maintenance. Rollers and wheels shall be free running to prevent unintentional diverting of units being conveyed when such a diverted unit could create a hazard to personnel.

6.12 Screw Conveyors

6.12.1 Safety Considerations

(a) Screw conveyors shall not be operated unless the conveyor housing completely encloses the conveyor moving elements, and power transmission guards are in place, except as provided in (b) and (c) below.

(b) If the conveyor must have an open housing as a condition of its use and application, the entire conveyor is then to be guarded by a railing or fence, unless guarded by location.

(c) Feed openings for shovel, front end loader, or other manual or mechanical equipment shall be constructed in such a way that the conveyor screw is covered by grating. If the nature of the material is such that a grating cannot be used, then the exposed section of the conveyor is to be guarded by a railing and there shall be warning signs posted.

6.13 Shuttle Conveyors, Belt Trippers, and Transfer Cars

6.13.1 Safety Considerations

(a) These conveyors shall be provided with a brake, rail clamp, or other position locking device.

(b) Means shall be provided to limit travel. Stops shall be provided beyond the normal travel limits to stop the conveyor in case of overtravel.

(c) When the conveyor and its path are obstructed from the view of the controlling operator, the conveyor shall have a device to warn of its movement or provide other means to assure personnel safety in the area.

(d) Sweeps shall be provided for all moving cars, trippers, or shuttles to deflect objects ahead of pinch points between wheels and rails, where a hazard to personnel would result without the sweep.

(e) Although all nip and shear points shall be guarded, it is not the intent of this requirement to provide guards where the belt rides on the idlers.

(f) Trippers or shuttles may discharge into silo or bunker openings, with or without seals. In either case, openings shall be provided with grating to suit the material being handled, and the width of the openings shall not be large enough to permit personnel to fall through.

Where material size requires openings that would permit personnel to fall through, the openings shall be protected by other means.

(g) Where power is electrically provided via trolley or rail, these power conductors shall be guarded in such a manner as to prevent accidental contact by personnel. In explosive areas, explosion proof equipment and cable reels shall be used instead of trolley or rail.

(h) When a person is required to move with the shuttle, tripper, or transfer car, a work station shall be provided for his protection.

6.14 Skip Hoists — Bulk Materials

6.14.1 Safety Considerations

(a) Limit switches shall be provided to establish limits of travel of the skip bucket. Additional switches shall be provided to interrupt the power supply and actuate the hoist brake whenever the skip bucket, through failure of the design travel limit switches or for any other reason, exceeds the design travel limit by a predetermined safe distance.

(b) Slack cable switches shall be provided and so arranged that whenever the skip hoisting rope or the counterweight hoisting rope develops slack or loses tension due to sticking in the guides, overtravel, or for any other reason, power to the drive will be cut off and the brake will be set.

(c) Riding the skip bucket by personnel shall be forbidden.

6.14.2 Guarding

(a) All sheaves shall be fitted with sheave guards to prevent the wire rope from coming off the sheaves under a slack cable or similar condition.

IMPORTANT: The general safety standards in Section 5 form a part of and must be used with the specific standards in Section 6.

(b) The guarding of the wire rope and drum on the hoist is normally not practical due to fleet angle requirements. If the hoist unit is located in an area that is generally accessible, then a complete wire mesh or similar guard shall be placed around the hoist. This guard is not required when guarded by location.

6.14.3 Operation and Maintenance

(a) The following wearing parts should be regularly and frequently inspected by qualified maintenance personnel and should be maintained regularly or replaced when the degree of wear indicates possibility of failure before the next inspection:

(1) brake shoes and brake operating parts
(2) hoisting ropes, clamps, and attachments
(3) sheaves, particularly head sheaves
(4) tracks, wheels, and mechanisms
(5) limit switches and slack cable device

(b) Whenever the brake or any parts of the drive train between the brake and the drum shaft are being repaired or replaced, the skip bucket and counterweight shall be blocked in their guides.

6.15 Slat Conveyors and Roller Slat Conveyors

6.15.1 Safety Considerations. A slat conveyor can present a shear point when the gap between the slats is great enough to permit access to cross members below the slats. At these points all members should be a safe distance away from the slats, or a continuous pan under the slats should be provided.

6.15.2 Guarding. A hazard exists at the tail end of a slat conveyor in which the slats are above the center line of the chain. The gap between slats closes when the slats reach the top surface of the conveyor. This area should be guarded. If the material flow enters over the tail sprocket, making guards impractical, a warning sign should identify the hazard.

6.16 Suspended Vertical Tray Conveyors

6.16.1 Safety Considerations

(a) Means shall be provided to sense overloads where these loads could cause failure and injury to personnel.

(b) Automatic loading and unloading devices are recommended to prevent placing of any parts of the human body into the path of vertically traveling carriers.

6.16.2 Guarding

(a) The conveyor shall be installed in an enclosed shaftway or housing to prevent injury from inadvertent physical contact with moving parts of the equipment. Access doors to the shaftway or housing shall be secured so that only authorized service personnel may enter.

(b) For suspended vertical tray conveyors designed so that the pendant tray, car, or carrier comes to a stop during manual loading or unloading, the conveyor housing should be equipped with interlocked doors or equivalent safety barriers at each manual loading and unloading station. The doors shall be mechanically or electrically interlocked to the operation of the conveyor so that they can be opened only when the pendant tray, car, or carrier has stopped, and so that the pendant tray, car, or carrier cannot be moved until they are closed.

(c) Suspended vertical tray conveyors designed to automatically receive and discharge material may have interlocked doors as in (b) above or, as an alternative, may be guarded by a suitable enclosure extending on all sides a safe distance from the path of the moving pendant trays, cars, or carriers.

6.17 Tow Conveyors — In the Floor

6.17.1 Safety Considerations

(a) A clearance space for personnel shall be provided between the side of a cart, or between any load overhanging the side of a cart, and any fixed or moving object.

(b) The cart path shall be identified by a floor stripe parallel to the cart path, one line on each side, located a safe distance from the edge of the cart or overhanging load.

(c) Where wall openings or other conditions do not permit a safe clearance, the reduced clearance area shall be marked with appropriate warnings.

(d) Where a cart may change its direction without warning, such as switching off the main line into a transfer conveyor or a spur, this area shall be marked with an appropriate warning such as diagonal stripes on the floor within the clearance lines.

(e) Where carts start automatically, a warning is required.

(f) Means shall be provided to allow the operator to disengage the tow pin from the conveyor pusher without being in front of the cart.

6.17.2 Guarding

(a) Provisions shall be made to prevent runaway carts from exiting the ramp zone and entering work areas.

IMPORTANT: The general safety standards in Section 5 form a part of and must be used with the specific standards in Section 6.

(b) Ramps with traffic aisles shall have a barrier of sufficient strength and height to prevent a runaway cart from entering the traffic aisle.

(c) Ramps without traffic aisles shall have warning signs to warn personnel not to enter.

(d) Means shall be provided to maintain the stopped position of a ramp conveyor or carts under maximum rated load condition.

(e) Where there is a projection above the floor, the projection and adjacent area shall be identified by appropriate diagonal stripes or warning signs, or both. This identification shall particularly apply to devices that project intermittently at unpredictable times.

6.18 Trolley Conveyors and Power and Free Conveyors

6.18.1 Safety Considerations

(a) In areas where the parted chain, cable, or other linkage would permit a runaway condition on an inclined or declined section, and where personnel are present, antirunaway devices shall be provided. The conveyor path may be arranged so that travel of the uncontrolled conveyor will be arrested before it enters an area where personnel are present.

(b) In areas where personnel perform work on the load of a moving conveyor, and guards would impair the workers' performance, the load shall be cradled, hooked, bolted, or otherwise attached to the carrier.

6.18.2 Guarding

(a) Nip points occur at traction wheels, sprockets, caterpillar drives, and roller turns, and shall be guarded unless guarded by location.

(b) The telltale effect of the moving conveyor components serves as a warning device and permits unguarded nip or shear points at heights of less than 8 ft (2.44 m).

(c) Automatic stops or closures shall prevent a trolley or trolleys from moving off the tracks during the portion of a cycle when any track end is not aligned with its mating member.

(d) Hoisting equipment for lift sections or drop sections or both shall stop or control the vertical motion in the event of power failure.

(e) On inclined or declined conveyors or sections, where personnel are present and there may be an occurrence of uncontrolled movement of a free trolley, arresting devices shall be provided. A rigid pusher dog on the power chain with positive carrier engagement shall be considered an acceptable means, or the conveyor path may be arranged so that travel of the uncontrolled free trolley, carrier, or load, or combination thereof, will be arrested before it enters the personnel area.

(f) Guards shall be provided to restrict unauthorized personnel from entering hazardous loading, unloading, and transfer areas. When guarding is not feasible, clear and legible warnings shall be provided.

(g) Access to lift or drop sections shall be guarded to prevent unauthorized personnel from entering the area. Warning signs shall be posted where guarding is not feasible, unless access to lift or drop sections is guarded by location.

(h) Where conveyors are located above personnel and the possibility exists that the transported product may fall off from any cause, guards (spill guards) shall be provided.

6.19 Vertical Articulated Conveyors

6.19.1 Safety Considerations

(a) Control system shall include means to prevent jamming or spilling objects, if the absence of such controls could produce a hazard to personnel.

(b) Means shall be provided to stop the conveyor in the event a jam occurs, where injury to personnel would otherwise result.

6.19.2 Guarding

(a) The conveyor shall be enclosed to prevent injury from inadvertent physical contact with the moving parts of the equipment.

(b) The entry and exit openings in the enclosure shall be guarded by extending the enclosure side guards a safe distance from the path of the vertically moving carrier. A top cover shall be provided to form a tunnel if practical.

6.20 Vertical Chain Opposed Shelf Type Conveyors

6.20.1 Safety Considerations. Overload devices shall be furnished to stop the conveyor in the event a jam occurs, where injury to personnel would otherwise result.

6.20.2 Guarding

(a) The conveyor shall be housed so as to prevent injury from inadvertent physical contact with the moving parts of the equipment.

(b) The conveyor housing should be equipped with doors or equivalent device at each manual loading and unloading station, interlocked so that they can be opened only when the carrier has stopped and the carrier cannot be actuated until they are closed.

IMPORTANT: The general safety standards in Section 5 form a part of and must be used with the specific standards in Section 6.

(c) Vertical chain opposed shelf conveyors that automatically receive and discharge material may have interlocked doors as in (b) above or, as an alternative, may be guarded by a suitable enclosure extending from the path of the moving carrier platform.

6.21 Vertical Reciprocating Conveyors

6.21.1 Safety Considerations

(a) Means shall be provided to prevent hazard to personnel in the event of mechanical or electrical failure. The carrier must be equipped with backstop devices sufficient to stop and to hold the carrier and load.

(b) Overtravel device(s) shall be provided where necessary to minimize potential for injury to personnel.

(c) Riding the conveyor shall be forbidden to all personnel. Warning signs to this effect shall be prominently posted at each point of access and each point of operation.

IMPORTANT: The general safety standards in Section 5 form a part of and must be used with the specific standards in Section 6.

6.21.2 Guarding

(a) The conveyor shall be guarded so as to prevent injury from inadvertent physical contact.

(b) The conveyor housing should be equipped with doors or an equivalent device at each manual loading and unloading station, interlocked so that they can be opened only when the carrier has stopped at that level and such that the carrier cannot be actuated until they are closed. This requirement is mandatory where solid doors prevent the user from seeing the carrier.

(c) Vertical reciprocating conveyors designed to automatically receive and discharge material may have interlocked doors as in (b) above or, as an alternative, may be guarded by a suitable enclosure extending from the path of the moving carrier.

(d) Where the application requires that personnel walk onto the carrier to load or unload material, the carriers shall be provided with standard railings, snap chains, or equivalent, across the loading/unloading side(s). Snap chains shall be at least 39 in. at their lowest point.

(e) Controls shall be installed or located so they cannot be actuated by a person on the carrier.

ASME B20.1 Interpretations

Replies to Technical Inquiries
January 1995–August 1995

FOREWORD

This publication includes all of the written replies issued between the indicated dates by the Secretary, speaking for the ASME B20 Committee, Safety Standard for Conveyors and Related Equipment, to inquiries concerning interpretations of technical aspects of ASME B20.1, Safety Standard for Conveyors and Related Equipment.

These replies are taken verbatim from the original letters except for a few typographical corrections and some minor editorial corrections made for the purpose of improved clarity. In some few instances, a review of the interpretation revealed a need for corrections of a technical nature: in these cases a corrected interpretation immediately follows the original reply.

These interpretations were prepared in accordance with the accredited ASME procedures. ASME procedures provide for reconsideration of these interpretations when or if additional information is available which the inquirer believes might affect the interpretation. Further, persons aggrieved by this interpretation may appeal to the cognizant ASME committee or subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Interpretation: 20-8

Subject: ASME B20.1-1993

Date Issued: March 10, 1995

Question: In Section 6.7.2(a), for those situations not guarded by location or position, does the second alternative ("the underside shall be covered") call for covering the entire underside of the conveyor or just the underside of the chains and sprockets?

Reply: Section 6.7.2 states:
"6.7.2 Guarding
(a) on chain driven live rollers, in addition to covering the top of the sprockets, the guard shall extend downward to obstruct entrance from the side and from below, or the underside shall be covered, unless guarded by location or position."
Section 6.7.2(a) requires that the chains and sprockets be covered; not the entire underside of the conveyor.

Interpretation: 20-8R

Subject: ASME B20.1-1993, Reconsideration of Interpretation 20-8

Date Issued: July 31, 1995

Question (1): For those situations not guarded by location or position, would a guard which covered the top and "the underside" of the chains and sprockets (not the entire underside of the conveyor, since you eliminated that possible interpretation in your response to my original letter) but did not cover either of the two sides of the chains and sprockets satisfy the requirements of 6.7.2(a)?

Question (2): Would a guard which covered the top and "the underside" of the chains and sprockets but did not cover the inside satisfy the requirements of 6.7.2(a)?

Question (3): The first alternative offered in 6.7.2(a) calls for the guarding which covers the top of the chains and sprockets and extends downward to obstruct the entrance from the side and from below, where the word "side" is singular. Is on the outside meant, or is it assumed that the outside will always be covered and the Standard intends to mandate covering the inside?

Reply: The response to all three questions is as follows:
Section 6.7.2 states:
"6.7.2 Guarding
(a) on chain driven live rollers, in addition to covering the top of the sprockets, the guard shall extend downward to obstruct entrance from the side and from below, or the underside shall be covered, unless guarded by location or position."
The Committee cannot offer simple "yes/no" responses to your questions. The difficulty in answering your questions stems from the change in the B20 Standard which occurred in 1976. As stated in the Foreword, page iii:

"A change in format from a specification standard to a performance standard was deemed necessary. Simply stated, the Standard describes what end result should be achieved without the limiting specification usually given by a design and without the inclusion of finite material selection or dimensions."
Paragraph 6.7.2(a) simply cannot and should not be read in isolation. The requirements of Section 5.9, Guards and Guarding, along with Section 6.7, Live Roller Conveyors — Belt or Chain Driven, need to be evaluated together. The objective of the guarding requirements of the B20.1-1993 Standard is to prevent personnel from inadvertent contact of nip and shear points, as specifically stated in para. 5.9.1.1, ". . . protection of personnel from hazards . . ."
Paragraph 6.7.2(a) in and of itself does not require nor does it exclude any specific "sheet metal" type guarding solution because it is dependent upon the specific conveyor configuration, use, and human interface.

Interpretation: 20-9

Subject: ASME B20.1-1990

Date Issued: April 4, 1995

Question: If a hopper or chute, intended to feed material into a screw conveyor is positioned with its upper edges 36 in. above floor level so that persons cannot accidentally step into them, can the hopper or chute have an open top and comply with ASME B20.1-1990?

Reply: Paragraph 5.14(a) states:

"5.14 Hopper Cars and Chutes

(a) All openings to hoppers and chutes shall be guarded to prevent personnel from accidentally stepping into them. Where guards are not practical, warning signs shall be posted. If the hopper or chute is equipped with grating to protect against contacting the conveyors below, such grating shall be considered as sufficient guarding provided that one dimension of the opening does not exceed 2 in. (50.8 mm)."

Paragraph 5.14(a) of ASME B20.1-1990 envisioned only the condition where a person could "accidentally" step into a hopper or chute. However, this paragraph does not preclude the concern that exists from falling or reaching into the screw conveyor below the chute or hopper. To determine if the unit as described and drawn complies with ASME B20.1-1990, the requirements of para. 5.9.1 General Requirements of Guarding, and Section 6.12 Screw Conveyors, must be satisfied.

Please be advised the latest edition of this Standard is ASME B20.1-1993. In closing, ASME does not "approve," "rate," or "endorse" any item, construction, proprietary device, or activity.

Interpretation: 20-10

Subject: ASME B20.1-1993

Date Issued: April 5, 1995

Question: An installation designed and constructed in accordance with ASME B20.1-1993 is proposed to be used for conveying vehicles between floors in a car service center. In the operation, the authorized operating personnel are not allowed to travel with the vehicle and have to come out to the landing while the lifting platform is in motion and traversing between floors. The particular lifting platform under consideration will have a rated load of 2600 kg with a platform area of 2.3 m (wide) x 5.4 m (depth) and a vertical travel of 7.8 m between the two floors. Would such an installation fall within the Scope of the B20.1 Standard?

Reply: Yes. The conveyor you have described is a "vertical reciprocating conveyor" which is specifically included in ASME B20.1-1993. These conveyors commonly require a person to walk onto the carrier (lifting platform) while loading/unloading. If the configuration of the carrier has an open side at the upper elevation, the Standard requires the opening be protected to prevent a person from falling. Also, the controls must be located so they cannot be actuated by a person on the carrier. The specific provisions state:

Para. 6.21.2(d): "Where the application requires that personnel walk onto the carrier to load or unload, the carrier shall be provided with standard railings, with snap chains across the operating ends or equivalent."

Para. 6.21.2(e): "Controls shall be installed or located so they cannot be actuated by a person on the carrier."

Interpretation: 20-11

Subject: ANSI/ASME B20.1-1987

Date Issued: August 11, 1995

Question: Do the run-in points between the belt and the straight-run idler rollers represent a pinch hazard which requires guarding in accordance with ANSI/ASME B20.1-1987?

Reply: No. Paragraph 6.1.1(a) governs guarding nip and shear points on belt conveyors. The following para. 6.1.1(b) states: "It is not the intent of this requirement [para. 6.1.1(a)] to provide guarding along the conveyor length where the belt rides on the conveying or return rollers." (The referenced paragraph in brackets was added for clarification purposes only.)

It is understood that consistent with paras. 5.9.2(a) and (b) the rollers would not be in close proximity to a "work station" or where there is "frequent presence of public or employed personnel." Additionally, consistent with the general "Guarding of Nip and Shear Points" requirement of para. 5.9.3, the grated walkway, handrails, and pull cord all constitute "other means to assure safety."

AN AMERICAN NATIONAL STANDARD

ASME B20.1b-1998

ADDENDA

to

ASME B20.1-1996
SAFETY STANDARD FOR CONVEYORS
AND RELATED EQUIPMENT

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
Three Park Avenue • New York, NY 10016

Addendum G-2

Date of Issuance: February 16, 1999

ASME is the registered trademark of The American Society of Mechanical Engineers.

This code or standard was developed under procedures accredited as meeting the criteria for American National Standards. The Standards Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment which provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not "approve," "rate," or "endorse" any item, construction, proprietary device, or activity.

ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable Letters Patent, nor assume any such liability. Users of a code or standard are expressly advised that the determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations issued in accordance with governing ASME procedures and policies which preclude the issuance of interpretations by individual volunteers.

No part of this document may be reproduced in any form,
in an electronic retrieval system or otherwise,
without the prior written permission of the publisher.

The American Society of Mechanical Engineers
Three Park Avenue, New York, NY 10016-5990

Copyright © 1999 by
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
All Rights Reserved
Printed in U.S.A.

ASME B20.1b-1998

Following approval by the ASME B20 Committee and ASME, and after public review, ASME B20.1b-1998 was approved by the American National Standards Institute on December 2, 1998.

Addenda to the 1996 edition of ASME B20.1 are issued in the form of replacement pages. Revisions, additions, and deletions are incorporated directly into the affected pages. It is advisable, however, that this page, the Addenda title and copyright pages, and all replaced pages be retained for reference.

SUMMARY OF CHANGES

This is the second Addenda to be published to ASME B20.1-1996. A previous Addenda was published in 1998.

Replace or insert the pages listed. Changes given below are identified on the pages by a margin note, **(b)**, placed next to the affected area. Previous Addenda changes are indicated by **(a)**. The pages not listed are the reverse sides of the listed pages and contain no changes.

Page	*Location*	*Change*
11, 12	6.6.2(b)	Revised
	6.7.2(a)	Revised
16	6.21.2(b)	Revised

SPECIAL NOTE

The Interpretations to ASME B20.1 are included in this Addenda as a separate section for the user's convenience. This section, however, is not part of this Addenda or of the Standard itself.

(b) Where a chain conveyor is raised and lowered as a transfer mechanism, mounted within another conveyor, and where enclosure would impair the function, warning signs or personnel barriers shall be provided, unless guarded by location.

6.4 En Masse Conveyors

6.4.1 Safety Considerations. En masse conveyors are not considered as free standing and are to be braced at intervals indicated by the manufacturer. Eccentric platform loads or other lateral loads may require lateral bracing or other bracing or both.

6.4.2 Guarding. Inspection doors or maintenance doors or both should include signs warning of possible danger if opened or removed while conveyor is in operation.

6.4.3 Operation and Maintenance

(a) Where flight cleaning or casing cleaning or both are required, they shall be performed by trained personnel with conveyor power supply locked out. Special attention may be required at feed and discharge points.

(b) When coupling or uncoupling the en masse conveyor line, the line shall be restrained to prevent injury through the uncontrolled travel of the broken line.

6.5 Flight and Apron Conveyors — Bulk Material

6.5.1 Safety Considerations. Inclined apron conveyors shall be equipped with lifting blades when the conveyor inclination exceeds the angle of slide of the design material.

6.5.2 Operation and Maintenance. At installation, flight and apron conveyors should be "jogged" or hand run through at least one complete revolution to check design clearances prior to running under automatic power.

Flight and apron conveyors handling sticky materials, which tend to build up, shall be cleaned as often as required for safe operation.

6.6 Inclined Reciprocating Conveyors

6.6.1 Safety Considerations

(a) Means shall be provided to prevent hazard to personnel in the event of mechanical or electrical failure. The carrier must be equipped with backstop devices sufficient to stop and to hold the carrier and load.

(b) Overtravel devices shall be provided where necessary to minimize potential for injury to personnel.

(c) Riding the conveyor shall be forbidden to all personnel. Warning signs to this effect shall be prominently posted at each point of access and each point of operation.

6.6.2 Guarding

(a) The conveyor shall be guarded so as to prevent injury from inadvertent physical contact.

(b) The conveyor housing shall be equipped with doors or an equivalent means at each manual loading and unloading station, interlocked so that they can be opened only when the carrier has stopped at that level and such that the carrier cannot be actuated until they are closed. **(b)**

(c) Inclined reciprocating conveyors that automatically receive and discharge material may have interlocked doors as in (b) above or, as an alternative, may be guarded by a suitable enclosure extending from the path of the moving carrier.

(d) Where the application requires that personnel walk onto the carrier to load or unload material, the carrier shall be provided with standard railings, snap chains, or equivalent, across the loading/unloading side(s). Snap chains shall be at least 39 in. at their lowest point.

(e) Controls shall be installed or located so they cannot be actuated by a person on the carrier.

6.7 Live Roller Conveyors — Belt or Chain Driven

6.7.1 Safety Considerations

(a) Nip points occur between chain and sprockets on chain driven live roller conveyors.

(b) Nip points can occur between belt and carrier rollers on belt driven live roller conveyors.

(c) Nip points occur at terminals, drives, take-ups, idlers, and snub rollers where the belt changes direction. A return belt idler does not require guarding.

(d) Nip points occur on transfers and deflectors used with live roller conveyors.

(e) Shear points occur at automatic take-ups; they shall be guarded.

6.7.2 Guarding

(a) On chain driven live rollers, unless guarded by location or position, the nip point between chains and sprockets shall be enclosed, to prevent entry of hands, fingers, or other parts of the body into a point of **(b)**

IMPORTANT: The general safety standards in Section 5 form a part of and must be used with the specific standards in Section 6.

hazard by reaching through, over, under, or around the guard.

(b) On belt driven live roller conveyors, nip points between the belt and roller may be considered guarded if the load carrying rollers are spaced so as to prevent access, if plates or rods are placed between rollers, if pop-out rollers are used as load carrying rollers, or if other suitable guarding is used, such as guarding by location.

6.8 Mobile Conveyors

6.8.1 Safety Considerations

(a) Mobile conveyors shall be provided with a brake, rail clamp, or other position locking device for each motion, such as, but not limited to, luffing, slewing, and traversing, where movement would present a hazard.

(b) Limit switches shall be provided on rail mounted mobile conveyors to limit the travel within design limits. Rail stops shall be provided beyond the design travel limits to physically stop the mobile conveyor in case of overtravel.

(c) Sweeps shall be provided on all rail mounted mobile conveyors to deflect objects ahead of the nip points between wheels and rails where a hazard to personnel would result without the sweep.

(d) A mobile conveyor shall be designed to be stable against runaway or overturning under normal conditions of operation. Resting a portion of a mobile conveyor on the ground, a pile, or on any other support shall not cause instability of the machine.

6.8.2 Guarding

(a) Where power to electrically powered mobile conveyors is provided by trolley or rail, these conductors shall be guarded in such a manner as to prevent accidental contact by personnel.

(b) Access stairways, ladders, and platforms shall be designed and located so as to avoid hazardous shear or nip points between sections of structures that in operation move relative to each other.

6.8.3 Operation and Maintenance

(a) When a mobile conveyor exposed to high wind conditions creates a hazard to personnel, normal operation shall cease and, if necessary, the conveyor shall be moved to a parking position and secured.

(b) When an operator is required on a mobile conveyor, a platform or cab shall be constructed for his protection. The conveyor shall be designed so that, when the operator is on the platform engaged in the normal performance of his duties, he will be protected from injury.

(c) Where operation is such that there is danger of movement of the mobile conveyor into the stockpile or any other obstacle, a detector shall be provided to stop the conveyor movement.

6.9 Portable Conveyors, Extendible Belt Conveyors, and Car Unloaders

6.9.1 Safety Considerations

(a) The raising and lowering mechanism for the boom of a portable conveyor shall include in its design, or be provided with, a safety device that will hold the boom at any rated angle of inclination.

(b) A powered extendible conveyor shall be equipped with a device located on the outermost boom end that shall stop extension of the conveyor when contact is made with the device as may be required to protect personnel.

(c) An extendible conveyor shall be equipped with momentary contact push buttons without holding circuits to activate powered booms.

(d) Portable conveyors shall be stable when used within the manufacturer's rating so that the conveyor will not topple when in use or when being moved in the manner for which it was intended. When the portable conveyor must be lashed to prevent movement or overturning in high winds, a warning sign indicating the necessity shall be clearly posted.

(e) Guarding by location shall be determined with the boom in its lowest position.

6.10 Pusher Bar Conveyors

6.10.1 Safety Considerations

(a) If a hazard exists where the bar passes through the bed at the discharge end, suitable guards or warnings shall be provided at this point.

(b) Loads on the incline shall have pushers of adequate height above the bed or have top restraining members.

(c) All chains shall be guarded by suitable means, including warning signs, to prevent accidental contact with the moving chain.

(d) In a pusher bar conveyor having a roller bed, where the relationship between the height of the bar and the spacing of the rollers creates a hazard, adequate guarding shall be provided.

(e) When a shear point exists between the return pusher bar and a frame member, guarding shall be provided.

IMPORTANT: The general safety standards in Section 5 form a part of and must be used with the specific standards in Section 6.

(b) Ramps with traffic aisles shall have a barrier of sufficient strength and height to prevent a runaway cart from entering the traffic aisle.

(c) Ramps without traffic aisles shall have warning signs to warn personnel not to enter.

(d) Means shall be provided to maintain the stopped position of a ramp conveyor or carts under maximum rated load condition.

(e) Where there is a projection above the floor, the projection and adjacent area shall be identified by appropriate diagonal stripes or warning signs, or both. This identification shall particularly apply to devices that project intermittently at unpredictable times.

6.18 Trolley Conveyors and Power and Free Conveyors

6.18.1 Safety Considerations

(a) In areas where the parted chain, cable, or other linkage would permit a runaway condition on an inclined or declined section, and where personnel are present, antirunaway devices shall be provided. The conveyor path may be arranged so that travel of the uncontrolled conveyor will be arrested before it enters an area where personnel are present.

(b) In areas where personnel perform work on the load of a moving conveyor, and guards would impair the workers' performance, the load shall be cradled, hooked, bolted, or otherwise attached to the carrier.

6.18.2 Guarding

(a) Nip points occur at traction wheels, sprockets, caterpillar drives, and roller turns, and shall be guarded unless guarded by location.

(b) The telltale effect of the moving conveyor components serves as a warning device and permits unguarded nip or shear points at heights of less than 8 ft (2.44 m).

(c) Automatic stops or closures shall prevent a trolley or trolleys from moving off the tracks during the portion of a cycle when any track end is not aligned with its mating member.

(d) Hoisting equipment for lift sections or drop sections or both shall stop or control the vertical motion in the event of power failure.

(e) On inclined or declined conveyors or sections, where personnel are present and there may be an occurrence of uncontrolled movement of a free trolley, arresting devices shall be provided. A rigid pusher dog on the power chain with positive carrier engagement shall be considered an acceptable means, or the conveyor path may be arranged so that travel of the uncontrolled free trolley, carrier, or load, or combination thereof, will be arrested before it enters the personnel area.

(f) Guards shall be provided to restrict unauthorized personnel from entering hazardous loading, unloading, and transfer areas. When guarding is not feasible, clear and legible warnings shall be provided.

(g) Access to lift or drop sections shall be guarded to prevent unauthorized personnel from entering the area. Warning signs shall be posted where guarding is not feasible, unless access to lift or drop sections is guarded by location.

(h) Where conveyors are located above personnel and the possibility exists that the transported product may fall off from any cause, guards (spill guards) shall be provided.

6.19 Vertical Articulated Conveyors

6.19.1 Safety Considerations

(a) Control system shall include means to prevent jamming or spilling objects, if the absence of such controls could produce a hazard to personnel.

(b) Means shall be provided to stop the conveyor in the event a jam occurs, where injury to personnel would otherwise result.

6.19.2 Guarding

(a) The conveyor shall be enclosed to prevent injury from inadvertent physical contact with the moving parts of the equipment.

(b) The entry and exit openings in the enclosure shall be guarded by extending the enclosure side guards a safe distance from the path of the vertically moving carrier. A top cover shall be provided to form a tunnel if practical.

6.20 Vertical Chain Opposed Shelf Type Conveyors

6.20.1 Safety Considerations. Overload devices shall be furnished to stop the conveyor in the event a jam occurs, where injury to personnel would otherwise result.

6.20.2 Guarding

(a) The conveyor shall be housed so as to prevent injury from inadvertent physical contact with the moving parts of the equipment.

(b) The conveyor housing should be equipped with doors or equivalent device at each manual loading and unloading station, interlocked so that they can be opened only when the carrier has stopped and the carrier cannot be actuated until they are closed.

IMPORTANT: The general safety standards in Section 5 form a part of and must be used with the specific standards in Section 6.

(c) Vertical chain opposed shelf conveyors that automatically receive and discharge material may have interlocked doors as in (b) above or, as an alternative, may be guarded by a suitable enclosure extending from the path of the moving carrier platform.

6.21 Vertical Reciprocating Conveyors

6.21.1 Safety Considerations

(a) Means shall be provided to prevent hazard to personnel in the event of mechanical or electrical failure. The carrier must be equipped with backstop devices sufficient to stop and to hold the carrier and load.

(b) Overtravel device(s) shall be provided where necessary to minimize potential for injury to personnel.

(c) Riding the conveyor shall be forbidden to all personnel. Warning signs to this effect shall be prominently posted at each point of access and each point of operation.

IMPORTANT: The general safety standards in Section 5 form a part of and must be used with the specific standards in Section 6.

6.21.2 Guarding

(a) The conveyor shall be guarded so as to prevent injury from inadvertent physical contact.

(b) The conveyor housing shall be equipped with doors or an equivalent means at each manual loading and unloading station, interlocked so that they can be opened only when the carrier has stopped at that level and such that the carrier cannot be actuated until they are closed. **(b)**

(c) Vertical reciprocating conveyors designed to automatically receive and discharge material may have interlocked doors as in (b) above or, as an alternative, may be guarded by a suitable enclosure extending from the path of the moving carrier.

(d) Where the application requires that personnel walk onto the carrier to load or unload material, the carriers shall be provided with standard railings, snap chains, or equivalent, across the loading/unloading side(s). Snap chains shall be at least 39 in. at their lowest point.

(e) Controls shall be installed or located so they cannot be actuated by a person on the carrier.

ASME B20.1 Interpretations

Replies to Technical Inquiries
January 1995–August 1998

FOREWORD

This publication includes all of the written replies issued between the indicated dates by the Secretary, speaking for the ASME B20 Committee, Safety Standard for Conveyors and Related Equipment, to inquiries concerning interpretations of technical aspects of ASME B20.1, Safety Standard for Conveyors and Related Equipment.

These replies are taken verbatim from the original letters except for a few typographical corrections and some minor editorial corrections made for the purpose of improved clarity. In some few instances, a review of the interpretation revealed a need for corrections of a technical nature: in these cases a corrected interpretation immediately follows the original reply.

These interpretations were prepared in accordance with the accredited ASME procedures. ASME procedures provide for reconsideration of these interpretations when or if additional information is available which the inquirer believes might affect the interpretation. Further, persons aggrieved by this interpretation may appeal to the cognizant ASME committee or subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Interpretation: 20-12

Subject: ASME B20.1-1976 (ANSI B20.1-1976)

Date Issued: August 10, 1998

Question: Is a horizontal screw conveyor located in a permanent underground unloading pit, associated with a commercial grain elevator, covered under the scope of ASME B20.1-1976 (ANSI B20.1-1976)?

Reply: ASME does not "approve," "rate," or "endorse" any item, construction, proprietary device, or activity. Therefore, the B20 Main Committee is unable to comment regarding your specific installation.

However, please note that the Scope of ASME B20.1-1976 encompasses all conveyor installations except those specifically excluded. The Standard applies to permanent conveyor installations moving bulk material. Additional safety considerations for "screw conveyors" are addressed in Section 6.12.

AN AMERICAN NATIONAL STANDARD

ASME B20.1a-1997

ADDENDA

to

ASME B20.1-1996
SAFETY STANDARD FOR CONVEYORS
AND RELATED EQUIPMENT

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
345 East 47th Street • New York, NY 10017

Date of Issuance: February 17, 1998

ASME is the registered trademark of The American Society of Mechanical Engineers.

This code or standard was developed under procedures accredited as meeting the criteria for American National Standards. The Consensus Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment which provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not "approve," "rate," or "endorse" any item, construction, proprietary device, or activity.

ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable Letters Patent, nor assume any such liability. Users of a code or standard are expressly advised that the determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations issued in accordance with governing ASME procedures and policies which preclude the issuance of interpretations by individual volunteers.

No part of this document may be reproduced in any form,
in an electronic retrieval system or otherwise,
without the prior written permission of the publisher.

The American Society of Mechanical Engineers
345 East 47th Street, New York, NY 10017

Copyright © 1998 by
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
All Rights Reserved
Printed in U.S.A.

ASME B20.1a-1997

Following approval by the ASME B20 Committee and ASME, and after public review, ASME B20.1a-1997 was approved by the American National Standards Institute on December 8, 1997.

Addenda to the 1996 edition of ASME B20.1 are issued in the form of replacement pages. Revisions, additions, and deletions are incorporated directly into the affected pages. It is advisable, however, that this page, the Addenda title and copyright pages, and all replaced pages be retained for reference.

SUMMARY OF CHANGES

This is the first Addenda to be published to ASME B20.1-1996.

Replace or insert the pages listed. Changes given below are identified on the pages by a margin note, (a), placed next to the affected area. The pages not listed are the reverse sides of the listed pages and contain no changes.

Page	*Location*	*Change*
8	5.9.1.4	Revised

transfer car: any wheeled device used for transferring loads from one conveyor line to another; may be manually or automatically operated

transfer mechanism: any mechanism that transfers objects onto or off a conveyor line or from one conveyor line to another

tray: a car, carrier, or pallet, usually suspended from the moving element of the conveyor, used to carry conveyed loads

tread plate: a plate of suitable size fitted between conveyor rollers to permit persons to use it as a working or walking surface

trolley: an assembly of wheels, bearings, and brackets used for supporting and moving suspended loads or for carrying load connecting and conveying elements such as chain, cable, or other linkage

truck (also known as cart)

(a) an assembly that supports another unit in either a fixed or adjustable position and that provides mobility

(b) a wheeled vehicle that can be detached from a conveying medium (usually chain) and pushed by hand

walkway: an elevated passageway for persons above the surrounding floor or ground level, including catwalks, footwalks, runways, and elevated walkways

work station: a physical location where a person is normally positioned which is located by design and supported with facilities necessary for a person to perform prescribed work duties. This position would not apply to maintenance location.

5 GENERAL SAFETY STANDARDS

5.1 Application

Conveyor equipment shall be used to convey only the specified commodities or materials within the rated capacity and the rated speed. Where special use is not indicated, or ratings are not available, good industry practice shall be used.

5.2 Maintenance (Repair)

(a) Maintenance and service shall be performed by qualified and trained personnel.

(b) Where lack of maintenance and service would cause a hazardous condition, the user shall establish a maintenance program to ensure that conveyor components are maintained in a condition that does not constitute a hazard to personnel.

(c) No maintenance or service shall be performed when a conveyor is in operation except as provided in paras. 5.3 and 5.4.

(d) When a conveyor is stopped for maintenance or service, the starting devices, prime movers, or powered accessories shall be locked or tagged out in accordance with a formalized procedure designed to protect all persons or groups involved with the conveyor against an unexpected restart. Personnel should be alerted to the hazard of stored energy, which may exist after the power source is locked out. Refer to ANSI Z244.1-1982, American National Standard for Personnel Protection — Lockout/Tagout of Energy Sources — Minimum Safety Requirements, and OSHA Standard 29 CFR 1910.147, "The Control of Hazardous Energy (Lockout/Tagout)."

(e) All safety devices and guards shall be replaced before starting equipment for normal operation.

5.3 Lubrication

(a) Conveyors shall not be lubricated while in operation unless it is impractical to shut them down for lubrication. Only trained and qualified personnel who are aware of the hazards of the conveyor in motion shall be allowed to lubricate a conveyor that is operating.

(b) Where the drip of lubricants or process liquids on the floor constitutes a hazard, drip pans, or other means of eliminating the hazard shall be provided.

5.4 Adjustment or Maintenance During Operation

When adjustment or maintenance must be done while equipment is in operation, only trained and qualified personnel who are aware of the hazard of the conveyor in motion shall be allowed to make adjustment or perform the maintenance or service.

5.5 Backstops and Brakes

Antirunaway, brake, or backstop devices shall be provided on all incline, decline, or vertical conveyors, where the effect of gravity will allow uncontrolled lowering of the load and where this load will cause a hazard to personnel.

5.6 Overload Protection

Where overload conditions would cause damage to equipment that could result in a personal injury, overload devices or suitable warning means shall be provided.

5.7 Gates and Switches

(a) Power positioned gate and switch sections shall be provided with devices that will prevent these sections from falling in case of power failure.

(b) Means shall be provided on all gate and switch sections to prevent conveyed material from discharging into the open area, created by lifting of the gate or switch.

5.8 Counterweights

When counterweights are supported by belts, cables, chains, and similar means, weights shall be confined in an enclosure to prevent the presence of personnel beneath the counterweight. As an alternative the arrangement shall provide a means to restrain the falling weight in case of failure of the normal counterweight support.

5.9 Guards and Guarding

5.9.1 General Requirements of Guarding

5.9.1.1 Guarding. Where necessary for the protection of personnel from hazards, all exposed moving machinery parts that present a hazard to personnel at work stations or operator's stations shall be mechanically or electrically guarded, or guarded by location or position.

5.9.1.2 Interfacing of Equipment. When two or more pieces of equipment are interfaced, special attention shall be given to the interfaced area to ensure the presence of adequate guarding and safety devices.

5.9.1.3 Guarding Exceptions. Wherever conditions prevail that would require guarding under this Standard but such guarding would render the conveyor unusable, prominent warning means, such as signs or warning lights, shall be provided in the area or on the equipment in lieu of guarding.

(a) **5.9.1.4 Maintenance of Guards and Safety Devices.** Guards and safety devices shall be maintained in a serviceable and operational condition. Warning signs provided in accordance with para. 5.9.1.3 shall be maintained in a legible/operational condition.

5.9.2 Guarding by Location or Position

(a) Remoteness from frequent presence of public or employed personnel shall constitute guarding by location.

(b) Overhead conveyors, such as trolley conveyors and hanger suspended tray conveyors, for which guarding would render the conveyor unusable or would be impracticable, shall have prominent and legible warnings posted in the area or on the equipment, and, where feasible, lines shall be painted on the floor delineating the danger area.

(c) When a conveyor passes over a walkway, roadway, or work station, it is considered guarded by location if all moving parts are at least 2.44 m (8 ft) above the floor or walking surface or are otherwise located so that personnel cannot inadvertently come in contact with hazardous moving parts.

(d) Although overhead conveyors may be guarded by location, spill guards, pan guards, or equivalent shall be provided if material may fall off the conveyor and endanger personnel.

5.9.3 Guarding of Nip and Shear Points. In general, nip and shear points shall be guarded unless other means to assure safety are provided. See Section 6 for specific conveyors.

5.10 Headroom

(a) When conveyors are installed above exit passageways, aisles, or corridors, there shall be provided a minimum clearance of 2.00 m (6 ft 8 in.) measured vertically from the floor or walking surface to the lowest part of the conveyor or guards.

(b) Where system function will be impaired by providing the minimum clearance of 2.00 m (6 ft 8 in.) through an emergency exit, alternate passageways shall be provided.

(c) It is permissible to allow passage under conveyors with less than 2.00 m (6 ft 8 in.) clearance from the floor for other than emergency exits if a suitable warning indicates low headroom.

5.11 Controls

5.11.1 Electrical Code. All electrical installations and wiring shall conform to the National Electrical Code (Article 670 and other applicable articles) as published by the National Fire Protection Association and as approved by the American National Standards Institute, Inc.

5.11.2 Control Station

(a) Control stations should be so arranged and located that the operation of the affected equipment is visible from them. Control stations shall be clearly marked or labeled to indicate the function controlled.

(b) A conveyor that would cause injury when started shall not be started until personnel in the area are alerted by a signal or by a designated person that the conveyor is about to start.

(1) When a conveyor that would cause injury when started is automatically controlled or must be