

Interpretation: 1-1

Subject: ANSI/ASME B20.1-1984

Date Issued: February 11, 1985

Question (1): Can the B20 Committee explain the differences between nip, pinch, and shear points as defined in ANSI/ASME B20.1-1984?

Reply (1): We wish to point out that a pinch point is a part of the definitions for nip point and shear point as defined in ANSI/ASME B20.1-1984. We believe that the definitions for nip point and shear point given therein and in Conveyor Equipment Manufacturers Association Conveyor Terms and Definitions, CEMA 102-1982, adequately describe these points and require no further interpretation. For your information, there are further definitions of nip points and shear points in ANSI B15.1-1984, Safety Standard for Mechanical Power Transmission Apparatus.

Question (2): In the definition of "nip point" on p. 4 of ANSI/ASME B20.1-1984, is the "rotating element" stated in the second line meant to be a powered or nonpowered element?

Reply (2): The rotating element referred to in the second line is intended to be a powered rotating element.

Question (3): Can the Committee offer any guidance with respect to minimum clearances required to guard a nip, pinch, or shear point?

Reply (3): These minimum clearances are beyond the scope of this Committee, as the B20.1 Standard is a performance standard and not a specification standard. For your information, the 8th Edition of the Accident Prevention Manual for Industrial Operations, published by the National Safety Council, does recommend relatively safe openings for some point of operation guards (pp. 301-309), as does ANSI B15.1-1984, Safety Standard for Mechanical Power Transmission Apparatus (pp. 3-6).

Interpretation: 2-1

Subject: ANSI/ASME B20.1-1984

Date Issued: August 22, 1985

Question: The first sentence of para. 5.12(a) of ANSI/ASME B20.1-1984 reads as follows: "Only trained employees shall be permitted to operate conveyors." Based on this wording, in the opinion of the B20 Committee, would the tenants in the situation described below be allowed to operate the equipment?

Vertical reciprocating conveyors are being used in two level self storage warehouses. The equipment is installed in accordance with the requirements of ANSI/ASME B20.1 and the tenants are being trained in the operation of the equipment. The entire storage complexes are secured by fences, guards, and other electronic measures. The equipment itself has keylock controls with only the tenants given keys, or keys are available at the office.

Reply: As stated in Section 3, the intent of the B20.1 Standard is to enhance the safe use of conveying equipment. Additionally, it has never been the intent of the B20.1 Standard to reserve the use of conveyors to employees nor to prohibit use of conveyors by owners, lessees, lessors, or any other specific group of people. Loading and unloading facilities, marinas, farms, rental agencies, and millions of other activities utilize material handling conveyors which are operated by someone other than an "employee."

The intent of para. 5.12(a) is to insure training is commensurate with the complexity of the conveyor or system. Some complex conveyor systems require the user to be extensively trained, but most types of conveyors are as simple and obvious as "start/stop" or "up/down."

In the specific installation cited above with a vertical reciprocating conveyor installed in accordance with the ANSI/ASME B20.1 requirements and equipped with keylock controls, there would be no safety reason to prohibit use of the conveyor by trained tenants. In fact, this is the ideal application envisioned in the B20.1 Introduction, where it is emphasized that accidents resulting from the manual handling of materials have been significantly reduced by using conveyors.

Interpretation: 3-1

Subject: ANSI/ASME B20.1-1984

Date Issued: May 29, 1986

Question: Some time ago, ASME ruled that vertical reciprocating conveyors could have a solid platform and could be loaded and unloaded manually.

The scope of B20.1-1984 states that the Standard applies to the "design," construction, installation, maintenance, inspection, and operation of conveyors and conveying systems. It also states that the Standard does not apply to platform elevators "designed" to carry passengers or an operator. I have emphasized the words *design* and *designed* for reasons that will become apparent.

Does the ruling outlined in the first paragraph intend to permit an installation, *designed*, approved, and operated since 1949 as an elevator permitted to carry an operator, to be altered so that it will operate and be covered under the B20.1 Standard? The alteration intended would eliminate several standard safety features common to elevators.

Reply: The ruling in the first paragraph of the question reads as follows: "To affirm that safety requirements for material handling devices, intended for moving inanimate objects and/or materials only and travelling (vertically or at an incline) between two or more floors wherein the load carrying unit travels in a fixed path predetermined by the supporting structure, are within the scope of the B20.1 Standard."

The affirmation was supported by four reasons, the first of which stated: "The intended usage of the described equipment (inclined and vertical reciprocating conveyors) is considered to be material handling *to the exclusion of carrying personnel.*" [Emphasis added.]

The B20 Standard "does not apply to platform elevators designed to carry passengers *or an operator.*" The essential distinction then becomes the intended usage (material vs. personnel). If the device is used for handling materials only and the control is located so that it cannot be operated from the carrier, B20.1 would be applicable. On the other hand, if a conveyor is equipped with controls on the carrier, the B20 Committee maintains that such a design is intended to accommodate the operator riding the carrier. Therefore, the A17.1 Standard would be applicable. ASME Codes and Standards do not address or prohibit the conversion of equipment from one application to another.

Interpretation: 3-2

Subject: ANSI/ASME B20.1-1984

Date Issued: October 6, 1986

Question: ANSI/ASME B20.1 defines a screw conveyor as a conveyor screw revolving in a suitably shaped stationary trough or casing fitted with hangers, trough ends, and other auxiliary accessories. Does this apply to screw conveyors that move liquid as well as bulk material?

Reply: The scope of ANSI/ASME Standard B20.1-1984, Safety Standard for Conveyors and Related Equipment, specifies that the Standard applies to conveyors which "may be of the bulk material, package, or unit handling types."

B20.1 includes a paragraph (para. 6.12.1) on safety considerations for screw conveyors. This paragraph pertains to screw conveyors used in handling bulk materials, not liquids.

Types of screws used in handling liquids are, to the best of our knowledge, produced by pump manufacturers. We are advised that these screws are of special design and tolerances. The pump industry might have standards covering such equipment and applications.

Interpretation: 4-1

Subject: Prevention, Protective Openings

Date Issued: March 6, 1987

Question (1): Both paras. 6.21.1(a) and 6.21.2(a) contain provisions to "prevent" hazard or injury to personnel. Does this imply that if any injury does happen the equipment is at fault?

Reply (1): The term "prevent" in this context means to impede or minimize and does not imply that an injury cannot occur. The intent of the B20.1 Standard is to present certain guidelines for the safe design, construction, installation, operation, and maintenance of conveyors and related equipment. It is not the function of the Committee to judge fault in specific incidents, nor can it anticipate and address deliberate or intentional acts by personnel to defeat protective devices.

Question (2): Paragraphs 6.20.2(b) and 6.21.2(b) require opening protectives at each manual loading or unloading station interlocked with the carrier. The wording provides that the opening protective can only be opened when the carrier has stopped at that level. This wording means that the opening protective must be locked closed when the carrier is in motion. However, the rule wording also permits the carrier to move away from the level with the opening protective only closed.

Is it the intent of this rule to require that the opening protective be closed and locked prior to any carrier motion?

Reply (2): No, it is not the intent of this rule to require that the opening be closed and locked prior to any carrier motion. The initial motion of the carrier engaging the gate locking device is sufficient. If a gate is opened after the carriage is activated and prior to the locking device engaging, the carriage will stop. The gate would have to be closed prior to motion continuing.

Interpretation: 4-2

Subject: Integral Machine Transfer Devices

Date Issued: May 27, 1987

Question (1): Please provide a definition of "integral machine transfer device." I've been unsuccessful in locating another document which gives a clear definition. Are conveying mechanisms that are subsystems of larger pieces of equipment considered "integral machine transfer devices"? Some examples of the types of equipment to which I refer include farm machinery and harvesting equipment, automatic bowling pin setting machines, road paving machines, etc. Each of these pieces of equipment contains one or more conveyors that are integral to the machine itself, while the machine is not in and of itself a conveyor. Most of the machines referenced in my example above also do not have specific safety-related codes written for them.

Reply (1): As used in this Standard, an integral machine transfer device refers to any device designed as an integral part of a machine to move a product or part from one location or position to another.

The examples mentioned in your question could be equipment utilizing "integral machine transfer devices."

Question (2): If the definition of "integral machine transfer device" includes the types of subsystem conveyors mentioned above, am I correct in concluding that ASME/ANSI B20.1 does not apply?

Reply (2): An integral machine transfer device is specifically excluded from ASME/ANSI B20.1, Safety Standard for Conveyors and Related Equipment.

Question (3): Even though the editions of B20.1 preceding 1976 do not contain the words "integral machine transfer devices" in the sentence beginning "Typical exceptions are . . . ," would the responses to Questions (1) and (2) remain the same? Has it always been the intention of the B20.1 Committee to exclude integral conveyors even though the words "Typical exceptions are . . . integral machine transfer devices" did not appear in the Standard?

Reply (3): The present Committee cannot comment on the intentions of previous B20.1 Committees. However, the member who proposed the "integral" language was contacted. It is his recollection that the words were added to Section 4 to clarify, not change, what was already included in "typical exceptions."

Interpretation: 5-1

Subject: Paragraph 6.11.1

Date Issued: May 26, 1988

Question: Paragraph 6.11.1(b) states: "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." However, there is no similar statement to cover powered roller conveyors.

If a worker "stops" a powered belt or roller conveyor, can he then step on, over, or across? My concern is an accidental "restart" while a worker is on the conveyor.

Reply: The concern addressed by para. 6.11.1(b) is the fall possibility when a person steps on free turning rollers or wheels. Depending on the specific installation, filler plates may be a practical means to eliminate that situation in free turning roller bed conveyors. Stepping "over" or "across" are not specifically addressed by para. 6.11. Depending upon the size and location of the conveyer, it should be obvious whether a person can safely step over or across the conveyor.

With reference to your concern about an accidental "restart" while a worker is on the conveyor, your attention is directed to paras. 5.2(d), 5.11.2(a) through (c), and 5.12(d). We believe these paragraphs from ASME/ANSI B20.1-1987 are self-explanatory.

Where personnel frequently cross an operating conveyor, it may be desirable that a crossover be used at this location, consisting of stairs, walkway, and handrail, which would allow personnel to walk up, over, and down the other side of the conveyor, without ever coming into contact with the conveyor or its load. This will allow personnel to cross the conveyor without the necessity of stepping onto the conveyor or stopping the conveyor operation.

Interpretation: 6-1

Subject: Performance Standard Versus Specification

Date Issued: April 7, 1989

Question: In the updating of this standard, it appears that something has been overlooked. The 1972 issue states in Section 5.14.2.1, *Moving Machine Parts*, "All moving machine parts shall, if feasible, be guarded. They may be guarded by their nature, in that they are intrinsically safe, as the pan of a housed-en-masse conveyor. They may be guarded by location, as is the piston of an internal combustion engine, or the head pulley of a belt conveyor or stacker. They may be guarded by shield guards, trough guards, or railing guards. In particular, all nip and shear points shall be guarded."

Under Section 6.01, *Belt Conveyors*, Section 6.01.3.1 states, "Belt conveyors shall be guarded in accordance with the applicable requirements of Section 5.13 and 5.14 — *General Safety Standards*."

In ASME/ANSI B20.1-1987 with 1988 Addenda, under Section 5.9, *Guards and Guarding*, nothing is stated specifically requiring guarding excepting only 5.9.3, *Guarding of Nip Points 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."

Under 6.1, *Belt Conveyors — Fixed in Place*, under Section 6.1.1, *Safety Considerations*, it states:

"(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 directions;

(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."

Should not this 1987 code require guarding moving parts including carrying rollers of belt conveyors, rollers which are not guarded by location or otherwise?

I am aware of accidents which have involved the carrying rollers and the belts and specifically the nip point between the carrying rollers and the belt. The requirement for guarding where people have access to the carrying roller position is clear in the 1972 code; was it intended that this requirement be deleted? If yes, why?

Reply: The changes referenced in your letter were made in the early and mid 1970's. There was considerable effort during that period to better express the B20 requirements in performance terms and also to be guided by OSHA's efforts to promulgate specific rules covering conveyors.

The present B20 Committee can clarify specific rules with an interpretation. However, when the text is clear, the Committee is not at liberty to comment regarding what was "intended" nor what should not have been included.

The Committee would appreciate any accident data you would be willing to share or any specific proposals for changes you would like to see made.

Interpretation: 6-2

Subject: Scope

Date Issued: July 19, 1989

Question: Does ANSI B20.1-1976 exclude conveyors used on farm equipment?

Reply: The scope of ANSI B20.1-1976 clearly states which types of conveyors are included and which type of conveyors are excluded from this Standard. It does not restrict in which types of industries these conveyors may or may not be used.

Your question refers to conveyors used on farm equipment. Please refer to the definition of conveyors as used in this Standard. If your referenced conveyor is an integral machine transfer device, such as being integral part of a forage wagon, it is not covered under this Standard.

Interpretation: 7-1

Subject: Difference Between a "Conveyor" Versus "Dumbwaiter"

Date Issued: April 5, 1990

Question: In what way would a "conveyor" (which is a car of 7.8 ft² platform, 500 lb capacity, operating inside a hoistway, in guide rails, serving two floors) differ from a "dumbwaiter" as described in ASME/ANSI A17.1-1987?

Reply: Differences between a vertical reciprocating conveyor and a dumbwaiter are typically found in the guides, hoistway construction, platform requirements, controls, and power mechanisms. The distinguishing features of a dumbwaiter are its limitation in capacity, size, door heights, and car clearances.

The safety requirements for dumbwaiters are specifically included in the ASME A17.1 Code. The B20.1 Standard includes the definition of a dumbwaiter and specifically excludes that device from its scope.

Interpretation: 7-2

Subject: The Applicability of Previous B20.1 Editions

Date Issued: July 9, 1990

Question: My interpretation of the Standard has been:

(1) Reference to the applicable National Consensus Standard, ASME/ANSI B20.1, means that ASME/ANSI B20.1a-1988, Addenda, and B20.1b-1987 are applicable.

(2) By this interpretation, the previous editions, 1947 through 1984, superseded by the current edition are no longer considered in effect. As an example of this interpretation, consider a conveyor installation, designed and built in 1974. The original design and installation would be appropriately evaluated according to ANSI B20.1- 1972. A current review of the installation according to the applicable National Consensus Standard would require application of ANSI B20.1a-1988 and B20.1b-1987. The only applicable National Consensus Standard relating to the equipment as it is in operation at this time is the current version.

Is this interpretation correct? If not, please explain the difference in interpretations.

Reply: The policy of the ASME B20 Committee is to interpret the Standard when requested and to avoid commenting on private interpretations of others. Therefore, we decline to answer your question, "Is this interpretation correct?" However, the following explanation may aid you in your application of the B20 Standard.

Various editions of the B20.1 Standard have been published starting in 1947. The applicability of a particular edition is related to the time when a specific conveyor is designed, manufactured, and installed. The publication of a new edition does not imply that an earlier publication is no longer in effect; the Standard that is current at the time of installation continues to control. In short, it is the intent that a conveyor intalled in 1950 would be reviewed in accordance with B20.1-1947 and that it should not be held to the B20.1a-1988 requirements.

Interpretation: 8-1

Subject: Section 5.02.5 of ANSI B20.1-1976

Date Issued: April 15, 1991

Question: According to your interpretation what types of "maintenance" procedures and instructions should be posted on the machine? Does this requirement only apply to "operating" procedures and instructions which are to be posted on the machine? If these requirements apply only to operating procedures and instructions, why are these requirements listed under the maintenance subsection of the Standard?

Reply: Neither the B20 Committee nor the B20.1 Standard specifically identify "what types of maintenance" procedures and instructions should be posted on conveyors. This provision was removed from the Standard in the 1984 revision. The Committee does not keep a revision rationale file.

Interpretation: 20-1

Subject: The Scope of ASME B20.1-1990

Date Issued: April 15, 1992

Question: Does the Standard apply to multiple conveyor systems where the conveyors may consist of short, or movable, segments at loading points, intermediate transport points, or at discharge points?

Reply: The Committee believes the Standard clearly speaks for itself under the headings of Scope and Definitions, and, therefore, an interpretation is not required.

However, in an effort to assist you, the ASME B20.1-1990 Standard states as follows:

“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* operations.”

The words in italics above are for your attention, and are not so emphasized in the ASME B20.1-1990 Standard.

Interpretation: 20-2

Subject: ASME B20.1-1990, Section 6.7.2(b)

Date Issued: October 28, 1992

Question: Many members of CEMA produce a Zero Pressure Accumulation conveyor, a variation of Live Roller conveyors. At least three use a “Padded Chain” instead of a belt to drive the load carrying rollers.

Is the use of plates, rods, or similar guarding between rollers still considered acceptable in lieu of pop-out rollers?

Reply: ASME B20.1-1990, Section 6.7.2(b) states the following:

“On belt driven live roller conveyors, nip points between the belt and the 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.”

In response to your question, Section 6.7.2(b) plainly states that it is acceptable.

Interpretation: 20-3

Subject: ANSI/ASME B20.1-1984, Safety Standard for Conveyors and Related Equipment

Date Issued: October 28, 1992

Question: Can a freight elevator having its car controls removed, car gate removed, hatch doors removed and replaced by gates in the lobby areas and the floor modified for its special use with signs installed in lobby areas and at run stations (which are constant pressure), be classified as a conveyor or related equipment, if all B20.1 code standards are adhered to?

Reply: ANSI/ASME B20.1-1984 defines "conveyor" and "vertical reciprocating conveyor" as follows:

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 and inclined reciprocating conveyors. Typical exceptions are those devices known as industrial trucks, tractors, and trailers, tiering machines, cranes, hoists, power shovels, power scoops, bucket drag lines, platform elevators designed to carry passengers or the operator, manlifts, moving walks, moving stairways (escalators), highway or rail vehicles, cableways, tramways, pneumatic conveyors, robots, or integral machine transfer devices.

vertical reciprocating conveyor — a reciprocating power or gravity actuated unit (not designed to carry passengers or an operator) that receives only inanimate objects on a carrier and transmits these objects vertically from one elevation to another.

The Standard does not specify where the components to accomplish the above are to originate or who can "manufacture" a conveyor.

The answer to your question is yes.

Interpretation: 20-4

Subject: ASME B20.1b-1992, Para. 5.11.2(a)

Date Issued: March 19, 1993

Question: Must an operator of a VRC be able to see the carriage regardless of its position at the time he is actuating the controls?

Reply: Section 5.11.2(a) states:

“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.” (emphasis added)

In ASME B20.1, as it is in most ASME standards and OSHA regulations, “should” is defined as:

“*should* – this word indicates that the rule is a recommendation, the advisability of which depends on the facts in each situation”

Many types of conveyors and conveyor systems utilize control stations located such that the equipment and/or the movable components are not visible from the control station(s). The B20 Committee has no information where this practice has created any safety problems. If the “design and installation” of a conveyor system is “supervised” as the B20.1 Introduction cautions, locating the control station(s) is usually a simple common sense task for a “qualified engineer.”

Given the operating characteristics and specific safeguarding requirements for vertical reciprocating conveyors in B20.1, Section 6, there is no need for a person calling the carriage from a different level to actually see the carriage. Neither would there be any safety benefit gained nor need to see a carriage at any level where gates electrically interlocked per para. 6.21.2 are installed.

Interpretation: 20-5

Subject: ASME/ANSI B20.1-1987

Date Issued: April 14, 1993

Question: Does ASME/ANSI B20.1-1987 apply to a conveyor which is a component part of and integral to a palletizer?

Reply: Without more definitive information the B20 Committee cannot address your specific concern. However, as a general observation, a conveying section of a palletizer which is a "component part of and integral" to a machine would be excluded from the B20.1-1987.

Your attention is brought to Interpretation 4-1 issued on May 27, 1987 on the subject of integral machine transfer devices.

Interpretation: 20-6

Subject: ASME B20.1b-1992, Conveyors and Related Systems, Scope
ASME/ANSI B30.11-1988, Monorails and Underhung Cranes, Scope

Date Issued: October 18, 1993

Question: Is there a conflict between ASME/ANSI B30.11 and ASME B20.1 as to which standard applies to monorails?

Reply: To date there has been no misunderstanding between the B20 and B30 Committees regarding which pieces of equipment utilizing a single track are considered cranes/hoists and those that are a variation of a trolley conveyor often referred to as a monorail conveyor. In identifying the category one must go beyond the track configuration and access the function of the equipment and operational characteristics.

Interpretation: 20-7

Subject: ASME B20.1-1993

Date Issued: January 9, 1995

Question: Do the requirements in paras. 6.2 and 6.2.1 of ANSI Z535.1, Safety Color Code, apply to equipment falling within the scope of ASME B20.1-1993, Safety Standard for Conveyors and Related Equipment?

Reply: The ASME B20.1-1993 Standard does not make reference to the ANSI Z535.1 standard. Therefore, the B20.1 Standard does not require you to comply with the requirements cited in ANSI Z535.1.

Please be advised, the B20 Committee is not the developing committee for the ANSI Z535.1 standard, and, therefore, can not interpret the application of that standard.

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."

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.

Interpretation: 20-13

Subject: ASME B20.1

Date Issued: December 30, 1998

Question: Does a machine consisting of a molding process that moves on a gondola around a loop, which is 78 ft long and 14 ft wide, qualify as a conveyor under B20.1?

Reply: It is the Committee's understanding that such molding lines typically are comprised of a combination of machines, B20.1 conveyors, and integral machine transfer devices. The B20.1 Standard defines a conveyor as 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.

Interpretation: 20-14

Subject: ASME B20.1-1996

Date Issued: February 18, 1999

Question: Two slat sorters exist within one conveyor system. One travels at 400 fpm with a total distance of 292 ft. The other travels at 500 feet per minute with a total distance of 441 ft. The stop devices that will be provided both work as production stops to shut down the sorter. Both stop devices provide for a stopping distance of approximately 80 ft. Would this stopping distance be adequate within the framework of your definition of an emergency stop, since the stopping distance does not differ from that of a normal stop?

Reply: The definition "emergency stop" was included in B20.1 to differentiate between normal stops, which require no maintenance-type response, and stops required for abnormal production/operational events, which require an immediate response to stop the motion. It is not intended to address how fast or by what mechanism a stop is accomplished.

Interpretation: 20-15

Subject: ASME B20.1-1996

Date Issued: March 12, 1999

Question: In reference to para. 5.11.2(b)(1), what is a "required period of time"? Where is this value found? How is it determined, and by whom?

Reply: A "required period of time" is not a term of art but merely means a specific/determined length of time. The B20.1 is a performance standard; as there is no specific time appropriate for all conveyor systems, this paragraph provides only that a value be established and utilized. It is the intention of the rule that a qualified person would determine an appropriate duration sufficient to warn of the conveyor's impending start.

Interpretation: 20-16

Subject: ASME B20.1-1976

Date Issued: December 14, 1999

Question: We have assumed that because para. 5.14.1 states that hopper openings should be guarded to prevent someone from "...accidentally stepping into them," it applies to in-ground hoppers and not to hoppers that are elevated above the ground.

The hoppers with which we are dealing in our case are portable and are elevated off the ground. A worker must climb up on the frame of the hopper, a ladder, or some other device to get to the top of the hopper. Would an elevated hopper that does not have a grate or cover over the opening be in violation of para. 5.14.1?

Reply: The B20 Committee does not approve, rate, or endorse proprietary equipment. We believe the words in para. 5.14.1 are clear as to their intent. Paragraph 5.14.1 of ASME B20.1-1976 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 a conveyor that is covered by other sections of the standard.

Interpretations: 20-17

Subject: ASME B20.1a-1997

Date Issued: December 17, 2001

Question: ASME B20.1a-1997 5.11.2(2) states that “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, a clear concise, and legible warning sign shall be provided. The warning sign shall indicate that conveyors and allied equipment may be started at any time that danger exists, and that personnel must keep clear. Does the use of these signs, in a case where the facility has a Lockout – Tagout policy, relieve of the code requirement to have audible or visual warning prior to equipment startup?”

Reply: ASME and its Committees do not “approve, rate, or endorse any item, construction, proprietary device, or activity.” However, with regard to Section 5.11 and specifically paragraphs 5.11.2(b)(1) and 5.11.2(b)(2) the following should be clarified.

The requirements of 5.11.2(b) only apply to conveyors that when started would cause injury to a person doing her/his normal job function, for example a person working in and out of the path of an automotive assembly line. That requirement is not intended to apply to automated conveyor systems that start/stop on a regular basis usually governed by material flow criteria. Personnel are protected from such automated systems by following the other applicable General Safety Standards of sections 5 and 6. For persons involved in “service or maintenance” related to conveyors and related equipment/systems, the control of hazardous energy is governed by Section 5.11.4, which references the OSHA regulation

Interpretations: 20-18

Subject: ASME B20.1-1996, Paragraph 5.9.3 and 6.1.1(b)

Date Issued: October 23, 2002

Question: When a belt conveyor (that is fixed in place) is passing over a walkway below 8' (ex. 7'), and that conveyor has carrying and return rollers, do those carrying and return rollers need to be guarded?

It seems that Article 6.1.1(b) says that these do not need to be guarded, however, it seems that because they can be considered a nip point under article 5.9.3 and can therefore form a hazard, article 5.9.3 says they should be guarded. Article 6.1.1(b) and 5.9.3 would therefore contradict each other.

Reply: Paragraph 5.9.3 is part of the “General Safety Standards” section; it is prefaced by “In general” and tempered by “unless other means to assure safety are provided. See Section 6 for specific conveyors.” This wording is consistent with the B20 Standard’s intent of being a performance rather than design standard.

Paragraph 6.1.1(b) simply recognizes that many belt conveyors have “carrying or return rollers” that present no danger by their very nature/design. However, in any application where a return belt could present a dangerous condition, means should be provided for safe operation to all persons involved. The Standard does not require such locations to be guarded just because a belt is passing over a roller.

With regard to the specific conveyor configuration you describe in your question please note, “ASME does not “approve,” “rate,” or “endorse” an item, construction, proprietary device, or activity”. Therefore, the Committee is limited in its response to addressing the B20 Standard and makes no attempt to apply or interpret the Standard as it may apply to specific installations.

The Committee does not feel these provisions contradict each other. However, suggestions for improvement of the B20 Standard are always welcomed and may be submitted to the Secretary in accordance with Section 3.

Interpretations: 20-19

Subject: ASME B20.1b-1998, Paragraph 5.11.2(b)

Date Issued: May 27, 2003

Question: Section 5.11.2(b)(1) states that “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) If a conveyor has guarding installed in accordance to the B20.1 standard, are the “hazardous points” protected, thereby removing the need to provide the audible warning, if the remainder of the conveyor (such as the discharge location) can be seen from the control location?

(b) Does this requirement apply during maintenance and service of the machine where guards may be removed to access certain components?

Reply: (a) Section 5.11.2(b)(1) addresses that unique conveyor system where even though the other provisions of Sections 5 and 6 are met there remains a concern that a person who normally is in the area may be injured if not alerted prior to the conveyor start-up/ movement. A common example is an automotive assembly conveyor where if not alerted a worker could be injured when the conveyor is started.

The phrase “conveyor that would cause injury when started” applies to both conveyors “controlled from a remote location” and “automatically controlled” conveyors.

It is not the intent of the Standard that all conveyors “controlled from a remote location” and “automatically controlled” conveyors be equipped with warning devices. This provision is an exception to the norm and does not require prior to the starting of automatically controlled/sequenced conveyors that a warning be sounded every time a conveyor is started.

The term “hazardous points along the conveyor where personnel may be present” must be read in the context of paragraph 5.11.2(b)(1). In the assembly conveyor example the warning device must alert anyone along the line who could be injured. This use of “hazardous points” does not refer to those hazards requiring the guarding detailed in Section 5.9.

While a conveyor which is guarded in accordance with Sections 5.9 and 6 would not normally require a warning device; neither does having a warning signal negate the need to meet the other guarding requirements of Section 5 or 6.

(b) Section 5.11.2(b) has no applicability to maintenance and servicing activities which are addressed in Section 5.2.

Interpretation: 20-20

Subject: ASME B20.1-2003
Paragraph 6.17.2

Date Issued: February 24, 2004

Question (1): It was noticed that this paragraph was the only conveying method in Section 6 that includes the statement “Public Use Intended”. What is the definition of “Public Use Intended”?

Response (1): Section 6.17.2, “Tow Conveyors - Public Use Intended” covers a unique type of tow conveyor used in commercial stores where shopping carts are towed from one floor to another. Since the general public is intended to use/interface with the conveyor, special safety considerations have been included in section 6.17.2 to address that unusual situation.

Question (2): These questions apply if the above interpretation is that the definition of “Public Use” would include the trained employee workforce. Tow Conveyor systems are often supplied in a continuous moving, creeping mode to allow workers to perform various assembly functions as the cart travels through the work zone. This often necessitates workers crossing the Tow Conveyor path to access both sides of the cart for assembly purposes. Tow Conveyors speeds through the assembly process varies from 0.5 ft/min. to 0.75 ft/min. In addition, some systems operate in an index and dwell mode. In this mode, workers perform various tasks with the cart stationary at the workstation. After a pre-determined amount of time, the conveyor re-starts and indexes at a higher rate of speed. This speed varies from 60 ft/min to 90 ft/min. Both of the above modes have audible and visual warnings prior to system start, and include appropriate signs and warnings. What is the intent or interpretation regarding physically restricting people from the path of the towed vehicle?

Response (2): Section 6.17.2 is not applicable to industrial/commercial tow conveyors used in assembly applications. Those applications are addressed in Section 6.17.1.

Question (3): What is the definition of a ramp, or what constitutes a ramp (or as stated in 7.17.2.2, “incline or decline”)? As an example, is a ramp defined by a particular degree of angle or length of a ramp as a minimum guideline or starting point?

Response (3): “Ramp” as used in the B20 Standard is generic, that is “a sloping floor, walk, or roadway leading from one level to another” [Webster’s Collegiate Dictionary]. As stated in the Foreword the B20 “Standard describes what end result should be achieved without the limiting specifications usually given by a design and without the inclusion of finite material selection or dimensions.”

Interpretation: 20-21

Subject: ASME B20.1-2003
Paragraph 5.11.2(c)(2), Control Station

Date Issued: July 24, 2006

Background: In a system of slider bed conveyors, there are conveyor subsystems with inter-tied controls to transport baggage through the airport. The bags transfer through many different subsystems. Each subsystem is powered from an independent motor control panel (MCP) and each subsystem has an independent and unique emergency stop circuit, with emergency stop push buttons located throughout each subsystem. When one subsystem emergency stops, other subsystems are signaled to stop, by computer controls.

Example:

- Subsystem A transfers bags to subsystem B.
- Subsystem B is emergency stopped.
- Subsystem A is stopped by control system because subsystem B is emergency stopped.
- Even though subsystem B is emergency stopped we may need to bring bags to the transfer point, so a switch is used to allow subsystem A to run. But, the emergency stop on subsystem B is not effected and is still operational.

Question: Are other subsystem required to stop through the emergency stop circuit or can they just be programmed to stop by the computer controls, which can be overridden if needed to transport bags to the transfer point?

Response: Paragraph 5.11.2(c)(2) only addresses the "conveyor concerned" which may be a single conveyor or a single subsystem. The provision does not nor is it intended to address the operation of adjacent conveyors.

Interpretation: 20-22

Subject: ASME B20.1-2000
Paragraph 6.21.2(b)

Date Issued: January 31, 2007

Question (1): Does the term “interlocked” means that the conveyor housing must be constructed with a “door interlock device” as defined in the ASME A17.1 Safety Code for Elevators and Escalators?

Response (1): No. The term “interlocked” as used in B20.1-2000 is a verb, which describes the objective to be accomplished. It is not meant or intended to require A17.1 type “door interlock device”.

Question (2): Can the conveyor housing be constructed with a different device, or combination of devices, that also achieve the level of safety defined in paragraph 6.21.2(b)?

Response (2): Yes. Any device that will meet the performance criteria of Paragraph 6.21.2(b) is acceptable.

Interpretation: 20-23

Subject: ASME B20.1-1993
Paragraphs 5.9 and 6.1, Meaning of “guarded”

Date Issued: April 10, 2007

Question (1): A belt conveyor is installed in an area where only authorized personnel (technical and maintenance) are allowed. No operators or public have access in the area. Does this installation satisfy the intent of clause 5.9.2(a)?

Response (1): ASME does not “approve,” “rate,” or “endorse,” any item, construction, proprietary device or activity. Therefore, the Committee cannot respond to that question. See the definition for “guarded by location”.

Question (2): Is it correct to say that nip and shear points need not be guarded if they are already guarded by location?

Response (2): Definition for “guarded”:

Page 5, Definitions: *guarded* – shielded, fenced, enclosed, or otherwise protected by means of suitable enclosures, covers, casing, shields, troughs, railings, or by nature of location so as to reduce foreseeable risk of personal injury.

The B20 Standard is performance orientated and does not consider any one methodology of safeguarding a hazard to be preferable over another. While slightly different terminology is used such as “to prevent inadvertent physical contact” or “to reduce the risk of accidental contact”, the standard for safeguarding a nip or shear point hazard is the same. The B20 Standard does not support the concept that “redundant” or “secondary” safeguarding is necessary.

Question (3): With respect to guarding of nips and shear points in clause 6.1.1(a) relating to belt conveyors at these typical locations:

- (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 conveyors;
- (4) on transfers and deflectors used with belt conveyors;
- (5) at take-ups.

Is it correct to say that nips and shear points need not be guarded if they are already guarded by location?

Response (3): See response to question #2.

Interpretation: 20-24

Subject: ASME B20.1-2012
Return Idlers on Inclined Portion of Belt Conveyor, Paragraph 6.1.1(a)(7)

Date Issued: November 14, 2012

File: 12-1158

Question (1): The standard says “inclined conveyors”. Does it mean all conveyors (inclined, declined and flat) or just inclined conveyors?

Response (1): 6.1.1 applies to all belt conveyors fixed in place in all positions and requires guarding of nip points and shear points. While 6.1.1(a)(7) is a reference to a typically location, the requirement is that nip points and shear points are to be guarded. See definitions for “guarded” and “guarded by location”.

Question (2a): What is the intent and extent of return guarding required in ASME B20.1-2012 standard?

Response (2a): See response to question #1.

Question (2b): Is there a minimum height after which guard return idlers for in-plant conveyors no longer need to be guarded (example: 2’-0 no more guarding required)?

Response (2b): There is no minimum height requirement. See definitions for “guarded” and “guarded by location”.

Question (2c): Is there a minimum height after which guard return idlers for overland conveyors no longer need to be guarded (example: 2’-0 no more guarding required)?

Response (2c): There is no minimum height requirement. See definitions for “guarded” and “guarded by location”.

Question (2d): What about idlers inside of truss work?

Response (2d): See response to question #1.

Question (3): What about idlers that needs to be accessed while the belt is running (example: inverted Vee training idlers)?

Response (3): See response to question #1. See also Section 5.4, Adjustment or Maintenance During Operation.

Interpretation: 20-25

Subject: ASME B20.1-2012
Para. 6.21, Moving Vertical Reciprocating Conveyors

Date Issued: November 4, 2015

File: 15-2075

Question (1): Does Section 6.21 "Vertical-Reciprocating Conveyors" apply to relatively large, self-propelled material lifts that are part of a continuously moving (extremely/imperceptively-slow rate of travel) vehicle assembly line?

Response (1): See definition of "conveyor, vertical reciprocating" in ASME B20.1:
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.

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

Question (2): Specifically, can a "vertical-reciprocating conveyor" be utilized to routinely transport people up and down per ASME B20.1?

Response (2): ASME B20.1 vertical-reciprocating conveyors do not allow for the transport of passengers or operators.