

Standards Incorporated by Reference Little-Known Secrets

By David F. Coble

OSH professionals can find the following sentence in OSHA standards for general industry (29 CFR Part 1910.6), construction (29 CFR 1926.6), shipyard employment (29 CFR Part 1915.5) and marine terminals (29 CFR Part 1917.3): “The standards of agencies of the U.S. government, and organizations which are not agencies of the U.S. government which are incorporated by reference in this part, have the same force and effect as other standards in this part.” What does this mean?

The noted paragraphs are a list of the consensus standards written primarily by industry that OSHA has adopted as the law, officially called incorporation by reference (IBR). The OSH Act was signed into law Dec. 29, 1970, by President Richard Nixon. At Section 6(a), the OSH Act authorized the U.S. Secretary of Labor to adopt other federal standards and national consensus standards for a period of 2 years without having to go through the official rulemaking process.

Congress decided that since national consensus standards were written by highly knowledgeable, experienced professionals and had gone through a comprehensive review process, adopting these standards would simplify standards promulgation and provide immediate protection for America’s workforce.

This new agency (OSHA) chose to adopt several hundred of these other standards, and those adopted standards are incorporated into the law by means of a specific OSHA standard referring to that adopted standard.

Incorporation by Reference

IBR means that materials published by organizations other than OSHA can be codified as law when referenced in the text of an OSHA standard. In other words, many consensus and industry standards are also the law because of a specific action taken by OSHA.

For a document to be IBR, two key criteria must be met: 1) The material must be reasonably available; and 2) the director of the *Federal Register* must approve the incorporation by reference. *Reasonably available* has historically meant available for purchase from the organization that sponsors the material, or that the material can be found and reviewed at OSHA headquarters in Washington, DC, or one of the 10 regional OSHA offices.

For example, in 29 CFR Part 1910, the OSHA general industry standards, the author estimates that more than 200 documents are IBR, including American National Standards from ANSI, National Fire Codes from NFPA, Compressed Gas Association (CGA) standards, American Welding Society standards, UL standards and others. The specific standards from these organizations that are the law for general industry are listed in 1910.6, but the actual incorporation by reference is found in each specific OSHA standard that adopts the IBR standard. For example, ANSI A14.3, the safety code for fixed ladders, is IBR in OSHA general industry section 1910.68(b)(4) for manlifts, which states:

Reference to other codes and subparts. The following codes and subparts of this part are applicable to this section: Safety Code for Mechanical Power Transmission Apparatus, ANSI B15.1-1953 (R 1958); Safety Code for Fixed Ladders,

IN BRIEF

- OSHA requirements are more extensive than what is contained in the Code of Federal Regulations parts 1910, 1926, 1915 and 1917.
- Several hundred consensus and industry standards are also the law through a process called incorporation by reference.
- Standards incorporated by reference include additional inspection, training, management, maintenance and other requirements that are often overlooked.

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ANSI A14.3-1956; and subparts D, O and S. The preceding ANSI standards are incorporated by reference as specified in §1910.6. (OSHA, 2017c)

Therefore, fixed ladders used for manlift emergency escape must meet the 1956 version of ANSI A14.3.

Also, note the importance of understanding the nomenclature used in OSHA standards. The word *manlift* is used frequently in industry to characterize an aerial platform. However, a manlift that is regulated by 1910.68 is actually a belt-type personnel-lifting device that is defined as “a device consisting of a power-driven endless belt moving in one direction only and provided with steps or platforms and handholds attached to it for the transportation of personnel from floor to floor” (OSHA, 2017c).

Sometimes, OSHA incorporates only a part of an industry standard by reference. For example, the OSHA standard for vehicle-mounted work platforms [1910.67(b)(1)] incorporates ANSI A92.2 as follows:

Unless otherwise provided in this section, aerial devices (aerial lifts) acquired on or after July 1, 1975, shall be designed and constructed in conformance with the applicable requirements of the American National Standard for “Vehicle Mounted Elevating and Rotating Work Platforms,” ANSI A92.2-1969, including appendix, which is incorporated by reference as specified in §1910.6. (OSHA, 2017e)

Therefore, only the requirements in ANSI A92.2 that address design and construction of an aerial lift are incorporated as law.

In addition, there might be other documents that OSHA has incorporated by reference. For example, arc welding machine owner’s manuals became the law in 1910.254(d)(6), which states, “Manufacturers’ instructions. Printed rules and instructions covering operation of equipment supplied by the manufacturers shall be strictly followed.”

Manufacturer arc welding machine manuals typically include inspection, maintenance and training requirements not included in the OSHA standards. For example, the Miller Thunderbolt AC/DC model arc welder owner’s manual states that every 6 months the labels must be inspected, and dirt and dust must be cleaned from around the transformer and the fan motor. The shaft and sliding areas of the shunt must be lubricated annually. Therefore, the manufacturer inspection, maintenance and training rules become an OSHA requirement.

Also note that only the requirements in IBR standards designated with *shall* can be enforced. The second sentence in the OSHA incorporation standard reads, “Only the mandatory provisions (i.e., provisions containing the word *shall* or other mandatory language) of standards incorporated by reference are adopted as standards under the Occupational Safety and Health Act.” This is important because many consensus standards use both the words *should* and *shall*. However, *should* standards are often important to employee safety, considered best practice and, with few exceptions, should be followed. An example of one such exception is ANSI Z89.1-1997, American National Standard for Personnel Protection—Protective Headwear for Industrial Workers—Requirements, which is IBR

at 1910.135(b)(1)(iii). In ANSI Z89.1-1997, Appendix A, Paragraph A4, Cleaning, the standard states, “Shells should be cleaned with a mild detergent.” This *should* recommendation is likely good advice, but the hard hat manufacturer’s recommendations for cleaning the shell should also be consulted to ensure that a mild detergent is appropriate.

The Purpose of IBR

The purpose of incorporating standards by reference is twofold: 1) To reduce the physical size of the Code of Federal Regulations; and 2) To include industry requirements in the OSHA standards. As explained by the Office of the Federal Register:

Incorporation by reference is used primarily to make privately developed technical standards federally enforceable. Agency generated documents are presumptively ineligible for incorporation by reference because that material can and should be published in full text in the *Federal Register* and CFR. Agencies are not authorized to incorporate by reference material on their websites as a substitute for *Federal Register* publication. (U.S. National Archives, 2017)

Some of the research for this article was conducted at the North Carolina Department of Labor (NCDOL) in Raleigh, NC. The NCDOL library has a nearly complete set of IBR standards. Estimated conservatively, the volume of paper required to print the IBR standards would fill several long filing cabinet drawers.

However, using an electronic version of the OSHA rules, including the IBR standards, these rules could feasibly fit on a thumb drive or other portable hard drive, which is much easier to transport.

The OSHA standards are available on the agency’s website, but the several hundred IBR standards have limited availability electronically. One can purchase the IBR standard from the sponsoring organization (e.g., ANSI, NFPA, ASME). This is possible if the version of the IBR standard is still available. For example, at 29 CFR 1910.101(b), the OSHA standard states “the in-plant handling, storage and utilization of all compressed gases in cylinders, portable tanks, rail tankcars or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association (CGA) Pamphlet P-1-1965.” Therefore, the 1965 version is the law.

Sometimes, archived versions of these older IBR standards can be found online; in this case, CGA P-1-1965 is available at <https://law.resource.org/pub/us/cfr/ibr/003/cga.p-1.1965.pdf>. But other older IBR standards must be purchased or reviewed at an OSHA office that has these standards. Some sponsoring organizations, such as NFPA (2018), allow access to their standards via a website for review only. Free downloading and printing of these standards are typically not permitted because standards-setting organizations typically recoup much of their supporting funds through the sale of copyrighted standards.

Disadvantages to IBR

IBR also has disadvantages for standards users, perhaps the most significant of which is obtaining a copy of such a standard. Purchasing these indus-



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try standards can be cost-prohibitive, especially if a large number of standards is needed. Geography can also impede reviewing such standards. Many standards users do not live near Washington, DC, or an OSHA regional office.

Another disadvantage is that only a specific version of a consensus standard can be IBR. Dynamic incorporations are not allowed. This means that OSHA cannot adopt the 1970 version of a consensus standard and automatically state that as these consensus standards are updated, the newer version becomes the law. However, OSHA has issued written interpretations, such as in its letter dated Feb. 28, 2001, to H.B. Bud Hayden Jr.:

Under OSHA's *de minimis* policy, where OSHA has adopted an earlier consensus standard, employers who are in compliance with the updated version will not be cited for a violation of the old version as long as the new one is at least equally protective. (OSHA, 2001)

A third disadvantage to IBR is that OSHA must navigate the incorporating rules of the Office of the Federal Register. OSHA continues to incorporate standards by reference through the rulemaking process and, after 45 years of experience, this obstacle is not nearly as significant as in the early OSHA years.

A fourth disadvantage to IBR is determining whether and how OSHA's myriad interpretations for the standards written into the CFR apply to a requirement in an IBR standard. OSHA's interpretations are found primarily in directives and letters of interpretation. The presumption is that an interpretation also applies to an IBR standard.

For example, looking again at 1910.68(b)(4), which incorporates by reference ANSI A14.3-1956, Safety Code for Fixed Ladders, fixed ladders used for manlift emergency escape must meet the 1956 version of ANSI A14.3 (OSHA, 2017c). However, OSHA has issued a directive that exempts fixed ladders from cages and other requirements when used for emergency escape. The directive states:

F. Background. OSHA has historically established that the requirements of 29 CFR 1910.27 for cages, platforms or similar fall prevention protection devices are not appropriate for fixed ladders on structures where the fixed ladders are used only as a means of access by fire fighters, other emergency personnel, or escape for employees in fire and other emergency situations. Sometimes these ladders are not provided with employee protection as presently required in 29 CFR 1910.27, when they are intended to be used only in an emergency. In these circumstances, it is sometimes more hazardous to install a cage, well, landing platform or ladder safety device pursuant to the standard than it is not to comply. A cage or well, etc., may interfere with firefighting or other rescue equipment, or employee escape from fire or other emergency situations.

G. Guidelines. This instruction provides performance criteria for fixed ladders used only as a means of access for firefighters and other emergency personnel, or escape for employees in fire and other emergency situations.

1) Employers must establish and implement adequate administrative controls such as barricades and signs to prevent nonemergency use of fixed ladders which are meant for firefighter use and emergency escape only.

2) In the event the employer does not provide adequate administrative controls such as barricades or signs and employees use an emergency ladder for other than its intended purpose, the employer may be appropriately cited under 29 CFR 1910.27.

3) Fixed ladders not equipped with cages, landing platforms, ladder safety devices or other forms of employee protection, in some situations may be allowed as a means of access for firefighters and other emergency personnel, or escape for employees in fire and other emergency situations. These guidelines are provided because it may be more hazardous to comply with 29 CFR 1910.27 than not to comply. (OSHA, 1983)

It appears that the fall protection requirements for a fixed ladder in ANSI A14.3-1956 would not apply to the escape ladder on a manlift. To further complicate this issue, OSHA addresses emergency use of fixed ladders in the new 1910 Subpart D as follows:

1910.23(a)

Application. The employer must ensure that each ladder used meets the requirements of this section. This section covers all ladders, except when the ladder is:

1910.23(a)(1) Used in emergency operations such as firefighting, rescue and tactical law enforcement operations, or training for these operations. . . . (OSHA, 2017b)

But the new 1910.23(a)(1) does not mention emergency escape.

10 Little-Known Secrets About IBR Standards

Using and complying with IBR standards takes research, perseverance and the availability of these documents. With more than 200 additional documents in general industry alone, some requirements likely apply to a given employer. Following is an explanation of 10 little-known facts concerning IBR standards.

Secret #1

Safety and health professionals and managers sometimes believe through hearsay and historical practice that a safety rule is mandated by a standard. However, sometimes the actual requirements in an IBR standard are different from what is believed to be correct. For example, ANSI A13.1-1956 Scheme for the Identification of Piping Systems is IBR at 1910.253(d)(4)(ii), which states, "Aboveground piping systems shall be marked in accordance with the American National Standard Scheme for the Identification of Piping Systems, ANSI A13.1-1956, which is incorporated by reference as specified in Sec. 1910.6" (OSHA, 2007).

Numerous piping systems for burning and cutting gases are color-coded as the means of labeling (typically green for oxygen and red for the fuel gas). However, ANSI/ASME A13.1, Paragraph 8, Method of Identification, states, "Positive identifi-

cation of a piping system content shall be by lettered legend giving the name of the content in full or abbreviated form" (ANSI/ASME, 2015).

In addition, to paraphrase paragraph 9 of ANSI 13.1, when color is also used to give supplementary information, it must conform to the chart found in ANSI A13.1. According to the chart, fire protection is indicated by red, dangerous materials by yellow or orange, and so forth. Therefore, the contents of the pipe should be spelled out, such as *oxygen*, and color coding is supplemental.

Secret #2

OSHA has been deleting standards it deems unnecessary as part of a federal government initiative to reduce the number of regulations. Using 1910, general industry, as an example, this has resulted in some inadvertent errors that are not significant but are noteworthy. For example, 1910.6(e)(7) states, "ANSI A14.1-68 Safety Code for Portable Wood Ladders, Supplemented by ANSI A14.1a-77, IBR approved for §1910.261 (a)(3)(iv) and (c)(3)(i)" (OSHA, 1974).

However, 1910.261(a)(3)(iv) states, "Practice for the Inspection of Elevators (Inspector's Manual), A17.2-1960, including Supplements A17.2a-1965 and A17.2b-1967" (OSHA, 2017d). Section 1910.261(c)(3)(i) states, "[Reserved]." In OSHA standards, the word *reserved* means that a standard has been removed. It appears that ANSI A14.1 is no longer IBR.

The lesson is that some IBR standards may no longer be IBR or have been IBR in another paragraph. Nonetheless, a consensus standard adds value and should be reviewed.

Secret #3

Section 1910.6(e)(9) states that ANSI A14.3-1956, Safety Code for Fixed Ladders, is IBR in OSHA general industry section Manlifts 1910.68(b)(4), which states:

Reference to other codes and subparts. The following codes and subparts of this part are applicable to this section: Safety Code for Mechanical Power Transmission Apparatus, ANSI B15.1-1953 (R 1958); Safety Code for Fixed Ladders, ANSI A14.3-1956; and subparts D, O and S. The preceding ANSI standards are incorporated by reference as specified in §1910.6. (OSHA, 2017c)

Paragraph 1.4 in ANSI A14.3-1956 incorporates by reference four additional ANSI standards including ANSI A12-1932 for Floor and Wall Openings, Railings and Toe Boards.

The lesson is that additional consensus standards may be IBR in the original IBR standard and these additional standards may be the law as well, depending on the wording of the OSHA standard and the consensus standard.

Secret #4

Every site has machinery and equipment that must be maintained. Some OSHA standards such as Powered Industrial Trucks at 1910.178(a)(4) require written approval from the powered industrial truck manufacturer to modify the truck or make additions to the truck that affect capacity and safe

operation. On the other hand, modifications to equipment may be regulated by an IBR standard.

An example is elevators. The Pulp, Paper and Paperboard Mills standard, 1910.261, incorporates by reference the ANSI A17.1-1965 Elevator standard according to 1910.6(e)(10), which says, "ANSI A17.1-65 Safety Code for Elevators, Dumbwaiters and Moving Walks, Including Supplements, A17.1a (1967); A17.1b (1968); A17.1c (1969); A17.1d (1970), IBR approved for §1910.261 (a)(3)(vii), (g)(11)(i), and (l)(4)" (OSHA, 1974). Note that 1910.261(a)(3)(vii) is an error. The correct paragraph is 1910.261(a)(3)(iii). That paragraph states, in effect:

Establishments subject to this section shall comply with the following standards of the American National Standards Institute, which are incorporated by reference as specified in §1910.6: Safety Code for Elevators, Dumbwaiters and Moving Walks, A17.1-1965, including Supplements A17.1a-1967, A17.1b-1968, A17.1c-1969 and A17.1d-1970. (OSHA, 2017d)

Section 1910.261(g)(11)(i) states, with the scope of the standard: "Chemical processes of making pulp—Elevators shall be constructed in accordance with American National Standard A17.1-1965" (OSHA, 2017d).

Section 1910.261(l)(4) states, with the scope of the standard: "Finishing room—Elevators. These shall be in accordance with American National Standard A17.1-1965" (OSHA, 2017d).

Rule 900 Field Inspections and Tests in Part IX of ANSI A17.1-1965 requires at Rule 900.1b that new and major altered elevators must be inspected only by "an inspector employed by the enforcing authority" (ASA, 1965). This rule also states the tests specified in other rules 900.2 through 900.5 must be conducted by the firm installing or altering the elevator in the presence of an inspector employed by the enforcing authority. Therefore, plant maintenance cannot repair damaged freight elevator cars without the presence or approval of the elevator company representative and enforcing authority.

An example of the importance of this rule is noted in an incident description that can be found in an OSHA inspection detail report. The OSHA (1991) description states:

Fourteen employees were riding a freight elevator when a bearing failed, causing the wire rope to jump off the counterweight sheave. The counterweight fell, causing the elevator to fall approximately 45 ft to the pit. One car safety was broken and did not operate; the second safety did not hold. The employees sustained broken feet, legs, ribs and vertebrae, and bruises.

This incident brings up another rule that is sometimes overlooked. ANSI A17.1-1965 at Rule 207.4, Carrying Passengers on Freight Elevators, states, "Freight elevators shall not be permitted to carry passengers" (ASA, 1965). There are a few exceptions such as the freight elevator:

- may carry passengers not greater in number than the rated load divided by 150, in case of fire, panic or similar emergencies;

One disadvantage of IBR for standards users is determining whether and how OSHA's myriad interpretations apply to a requirement in an IBR standard.

•may carry employees provided special permission to do so is granted by the enforcing authority.

ANSI A17.1-1965 at Rule 207.5, Signs Required in Freight Elevator Cars, states at Rule 207.5a.2: "In elevators not permitted to carry passengers, a sign reading *This is not a passenger elevator, no persons other than the operator and freight handlers are permitted to ride on this elevator*" (ASA, 1965).

The lesson is that IBR standards contain important prohibitions, maintenance and testing requirements, and signage that are not specifically noted in 1910, 1926, 1917 and 1915.

Secret #5

Some OSHA standards are quite performance-oriented with little specificity as to what OSHA expects. For example, OSHA's rule for emergency eyewash and shower installations found at 1910.151(c) states, "Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use" (OSHA, 1998).

Key terms such as *injurious corrosive materials*, *suitable facilities* and *immediate emergency use* are not defined by this standard. ANSI Z358.1 American National Standard for Emergency Eyewash and Shower Equipment provides those details. However, ANSI Z358.1 is not IBR in the OSHA standards.

The lesson is that widely used consensus standards are often thought to be an OSHA requirement, when actually they are not specifically IBR.

Secret #6

Much of 1910.67 is a verbatim copy of ANSI A92.2-1969, Vehicle Mounted Elevating and Rotating Work Platforms. The scope of this OSHA standard is found at 1910.67(b)(1). This paragraph states in part:

Unless otherwise provided in this section, aerial devices (aerial lifts) acquired on or after July 1, 1975, shall be designed and constructed in conformance with the applicable requirements of the American National Standard for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-1969, including appendix, which is incorporated by reference as specified in §1910.6. (OSHA, 2017e)

Therefore, the design and construction of aerial lifts that fall under ANSI A92.2 must meet the design and construction requirements of ANSI A92.2. Design and construction requirements are found at ANSI A92.2, Paragraph 4, and include requirements not found in 1910.67. These rules include requirements for system protection to prevent the boom from falling in the event of a hydraulic line failure (§4.1), there are maximum load limits on the axles whenever the aerial lift is stationary or moving (§4.7), and hydraulic and pneumatic systems must have a bursting factor of at least four times the operating pressure for which the system was designed (§4.9).

ANSI A92.2 also has a requirement that appears to be in conflict with OSHA 1910. The ANSI stan-

dard at Paragraph 4.5 requires: "Each platform shall be provided with a rail or other structure around its upper periphery that shall be at least 38 in. above the floor of the platform" (ANSI, 1969).

This requirement appears to be in conflict with OSHA 1910.29(b)(1), which states: "The top edge height of top rails, or equivalent guardrail system members, are 42 in. (107 cm), plus or minus 3 in. (8 cm), above the walking working surface" (OSHA, 2017a).

OSHA has a policy that a vertical standard will take precedence over a horizontal standard when a hazard is covered by both types of standards. Vertical standards are defined as "related to particular industries such as construction work, textiles and pulpwood logging." Horizontal standards are defined as "standards in broad hazard categories applicable to many or all industries" (OSHA, 1978).

The rule for the aerial lift platform guardrail height found in ANSI A92.2 is a vertical standard. This rule applies only to aerial lift platforms. The OSHA rule at 1910.29(b)(1) is a horizontal standard. Therefore, 38 in. should be acceptable. However, a 38-in. high top rail will protect only a percentage of the workforce. Therefore, if an employee using the aerial lift has a center of gravity higher than 38 in., best practice is to provide additional protection.

This policy is found in the OSHA (2016) Field Operations Manual:

When a hazard in a particular industry is covered by both a vertical (e.g., 29 CFR 1915) and a horizontal (e.g., 29 CFR 1910) standard, the vertical standard shall take precedence even if the horizontal standard is more stringent.

In addition, the Appendix to ANSI A92.2 is also IBR. All rules in the Appendix appear to be "should" standards. But there is best practice guidance regarding maintenance, periodic inspections and tests, and operator's mental and physical fitness that should be considered.

The lesson is that requirements in the IBR consensus standards may conflict with other OSHA standards. The best practice is to follow the strictest standard, and if that still does not offer adequate protection for the worker, do whatever is necessary to protect the worker from an unacceptable risk. Also, many of the IBR consensus standards have appendices that may have additional requirements or, at a minimum, will offer best practices to consider.

Secret #7

ANSI B7.1-1970, Safety Code for the Use, Care and Protection of Abrasive Wheels, is IBR at 1910.215(b)(12) and 1910.218(j) as noted at 1910.6(e)(15).

Grinding machine requirements in the OSHA Forging Machine standard, 1910.218, states at paragraph (j)(5) "Grinding . . . equipment shall be used and maintained in accordance with ANSI B7.1-1970" (OSHA, 1996).

ANSI B7.1 has requirements for use and maintenance that OSHA standards 1910.215 and 1910.218 do not have. At Section 2, Handling, Storage and

Inspection, of ANSI B7.1, Paragraph 2.1, states, "wheels shall not be stored subject to: (a) Exposure to high humidity, water or other liquids; (b) Freezing temperatures" (ANSI, 1970).

Paragraph 2.3 provides additional information about the ring test required by OSHA at 1910.215(d) (1), stating, "Wheels must be dry and free of sawdust when applying the ring test" (ANSI, 1970). Explanatory information for paragraph 2.3 states, "Comparison of the sound with other wheels of the same lot and specification will allow rejection of any wheel with a suspiciously different ring before use" (ANSI, 1970).

ANSI B7.1, Paragraph 9.1, Users' Responsibility, states, "the grinding wheel operator shall be fully instructed in the use, care and protection of grinding wheels as defined in this Code" (ANSI, 1970). A training requirement for grinding machine operators is not found within the OSHA standard but is IBR. Operators must understand the limits of the grinding stones they use (vitrified aluminum oxide wheels are approved for ferrous materials only), machine guarding requirements (tongue guard, work rest, side guard), how to turn the machine on (stand to the side since the stone could blow up while building centrifugal speed), and how to perform the ring test.

The lesson is that consensus standards may add explanations and more information about a task (such as the ring test and storing of stones) that OSHA has not included. For an organization that is not a forging company, the inclination may be to think that this rule does not apply. However, using the General Duty Clause found at Section 5(a)(1) of the OSH Act, OSHA can apply these rules to any type of organization when the hazards are likely to cause death or serious physical harm. Another parameter of using the General Duty Clause is that the hazard must have been recognized. The OSHA (2016) Field Operations Manual states that when a code notes a hazard, recognition has occurred.

Secret #8

OSHA standards rarely address employee physical attributes needed to perform a job, however, consensus standards may. For example, ANSI B30.2.0-1967, Safety Code for Overhead and Gantry Cranes, includes operator qualifications for those who use hand signals and handle the load for crane operations regarding visual acuity, color blindness, hearing, emotional stability and whether an amputation or epilepsy will affect safety. ANSI B30.2.0 also addresses the best practice of having one's hands free to climb fixed ladders. This is found at Paragraph 2-3.4, Miscellaneous, 2-3.4.1, Ladders. The practice of climbing ladders with both hands free was recently addressed by OSHA standards in the new 1910 Subpart D, 1910.23(b)(13), which states, "No employee carries any object or load that could cause the employee to lose balance and fall while climbing up or down the ladder" (OSHA, 2017b).

ANSI A14.3-1956 does not address having one's hands free. ANSI B30.2.0 is IBR at 1910.179(b)(2) and 1910.261(c)(8)(iv).

The lesson is that consensus standards sometimes address issues that an OSH professional would like to know more about, such as employee physical qualifications. Also, it is common for an operations or maintenance manager to challenge the OSH professional to show the person where a particular requirement is stipulated. The consensus standards may support the OSH professional for a needed improvement. An example of this is climbing ladders with one's hands free.

Secret #9

Consensus standards are written by a committee that includes a broad representation of stakeholders for a specific topic. Committees include OSH professionals, engineers, union representatives, equipment manufacturers and interested public parties. People who participate in writing a consensus standard are typically listed at the front of a consensus standard, which also identifies the organization the person represents on the committee.

This can be important when an interpretation of a consensus standard is needed, or a simple explanation is needed of the intent of a statement in a consensus standard. Formal interpretations of consensus standards must be addressed by the committee through a formal interpretation process. But, informal interpretations or insight can sometimes be obtained by contacting a member of the committee. For example, as a listed member of the ANSI Z590.3, ANSI B11.19 and B15.1 committees, and as an alternate on the ANSI 01.1 committee, the author has been contacted for an opinion or explanation of a statement or requirement in those codes.

Secret #10

Finally, the IBR standards contain numerous requirements (when preceded by *shall*) for inspections of equipment, training of personnel and procedures that are not found in the OSHA standards. Examples include:

- American Petroleum Institute (API) 1104-1968, Standard for Welding Pipelines and Related Facilities, is IBR at 1910.252(d)(1)(v). Section 3 stipulates welder qualifications.

- API 2201-1963, Welding or Hot Tapping on Equipment Containing Flammables, is IBR at 1910.252(d)(1)(vi). General: "employment of capable welders and proper inspection of equipment prior to welding" (API, 1963).

- NFPA 30-1969, Flammable and Combustible Liquids Code, is IBR at 1910.178(f)(1) regarding storage and handling of liquid fuels for powered industrial trucks. Appendix B stipulates rules for storage tanks in locations that may be flooded.

- NFPA 34-1966 and 1995, Standard for Dip Tanks Containing Flammable or Combustible Liquids, is IBR at 1910.124(b)(4)(ii) and (iv) when mechanical ventilation is used. This rule may apply to parts wash tanks. Chapter 10 of NFPA 34-1995 requires training for "all personnel involved in dipping and coating operations in the potential hazards to safety and health; the operational, maintenance and emergency procedures required; and importance of constant operator aware-



Requirements in the IBR consensus standards may conflict with other OSHA standards.

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ness” (NFPA, 1995). Documentation is required to record the type and date of training in paragraph 10-1.4.

- NFPA 58-1969, Standard for the Storage and Handling of Liquefied Petroleum Gases, is IBR at 1910.178(f)(2), Powered Industrial Trucks. Section B.16, Instructions, states, “Personnel performing installation, removal, operation and maintenance work shall be properly trained in such functions” (NFPA, 1969).

- NFPA 62-1967, Standard for the Prevention of Dust Explosions in the Production, Packaging and Handling of Pulverized Sugar and Cocoa, is IBR at 1910.263(k)(2)(i), the Bakery Equipment vertical standard. At Section 32, Paragraph 3203, “Blowing down of any surfaces by compressed air is prohibited” (NFPA, 1967).

Conclusion

An effective occupational safety and health management system continually improves the techniques used to find all potential hazards, to evaluate the risks of all hazards, and to control risks to an acceptable level. A technique that every employer should include in its management system is to identify those standards incorporated by reference that apply to its operations. A review of these standards will likely uncover requirements or recommendations for training, inspections, tests, procedures, medical surveillance, employee selection, contractor control and equipment installations that are not included in OSHA Parts 1910, 1926, 1915 and 1917.

The safety and health literature is filled with buzzwords that the OSH profession uses, such as *safety excellence*, *world class safety* and *safety culture*. Those expressions are not really defined, but they include the expectation that no stone is left unturned to find and control unacceptable risks. Standards incorporated by reference may be some of those stones that have not yet been fully turned. **PS**

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