



Technical Standards Program

ESTA Standards Watch

February 2019 Volume 23, Number 3

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Six ESTA standards in public review

As this is being written, six draft ESTA are available for public review at <http://estalink.us/pr>. Comments on these standards are due before 9 April 2019. The reviews are **over** when that day starts, so act no later than 8 April.

BSR ES1.9, Crowd Management, is part of a suite of standards currently in development to address requirements for special event safety. It intends to define "crowd management," as distinguished from "crowd control," to provide an overview of crowd management theory and vocabulary, and to apply these terms to certain reasonably foreseeable risks that arise during live events. The standard is intended both to identify minimum standards and requirements, and also to provide questions and suggestions that help event organizers make reasonable choices under the circumstances of their event.

BSR E1.6-3, Selection and use of serially manufactured chain hoists in the Entertainment Industry, is a revision of the 2012 standard to update its requirements. It is one of a 4-part set of standards covering motorized rigging used in the entertainment industry. This standard addresses minimum safety requirements for the selection and use of serially manufactured chain hoists, having capacity of two tons or less, in the entertainment industry. It does not address the design or maintenance of these hoists. The standard is being updated to address outdated references, correct errors, and new technologies.

BSR E1.21, Entertainment Technology -- Temporary Structures Used for Technical Production of Outdoor Entertainment Events, is being revised to clarify and to enhance the requirements for operations management plans, designated person responsibilities, and related requirements pertaining to temporary structures used in the technical production of outdoor entertainment events. ANSI E1.21 establishes a minimum acceptable level of design and performance parameters for their design, manufacturing, use and maintenance. Its purpose is to ensure structural reliability, safety, and to establish a reasonable standard for care to which these structures are designed and used.

BSR E1.47, Recommended Guidelines for Entertainment Rigging System Inspections, is a revision of the 2017 standard. It is being revised to expand and to add clarity to its recommendations for inspections of rigging systems used in the entertainment industry.

BSR E1.59, Entertainment Technology--Object Transform Protocol (OTP), describes a mechanism to transfer object transform information such as position, orientation and velocity over an IP network using a subset of the ACN protocol suite. It covers data format, data protocol, data addressing, and network management. Data transmitted is intended to coordinate visual and audio elements of a production and should not be used for safety critical applications.

BSR E1.62, Minimum specifications for mass-produced portable platforms, ramps, stairs, and choral risers for live performance events, covers portable units, modules of a size and weight that allows them to be moved and erected by one or two people. Larger, heavier units are outside the scope of this standard. The scope also covers the railings provided as fall protection accessories, and to the legging systems.

ANSI approves reaffirmation of E1.48

On February 1 the ANSI Board of Standards Review approved the reaffirmation of ANSI E1.48 - 2014, A Recommended Luminous Efficiency Function for Stage and Studio Luminaire Photometry. No responses had been received during the standard's 45-day public review, so there were no comments to consider or objections to resolve.

The E1.48 standard specifies a $V(\lambda)$ function for photometry that more accurately reflects the response of the human eye at the extreme blue and red ends of the spectrum than the 80+ year-old function used with many light meters. The differences between the E1.48 and the older function are not great with continuous spectrum white light but are quite significant when measuring the output of RGB LED luminaires.

The new edition should be published and available a tsp.esta.org/freestandards before the end of February, but "reaffirmation" means that there will be no substantive changes. The new edition will say essentially the same things as the old.

Join the conversation at the New World Rigging Symposium

[Register now](#) for the second New World Rigging Symposium, produced by ESTA and USITT, taking place March 19-20, 2019 in conjunction with the USITT Conference and Stage Expo in Louisville, KY. Don't miss this opportunity to learn, discuss and debate rigging technology and practice as well as safety and workplace issues. The Symposium will provide 10 ETCP education renewal credits for re-certification.

Highlights include a keynote speech by Rocky Paulson and two sessions focused on engineering: *Entertainment Engineering: How to Get Everyone on the Same Page*, and *Engineering for Success: Why Things Don't Fall Down*. To see the full line-up of sessions, visit www.esta.org/nwrs_sessions.

[Registration](#) for the two-day Symposium, including lunches, reception and a USITT Stage Expo floor pass, is \$375. Register for both the Symposium and the full USITT Conference for \$675.

Help change the future of entertainment control

The Control Protocol's Working Group's Next Generation Task Group has created an online, ten-minute survey to determine how the standards already in the field are performing for stakeholders. How do standards such as DMX512, RDM, and sACN work for you? Do they make your job easier? Do you use all the features they offer? What kind of systems are you building with them? The task group wants to know the answers to these questions, so we're inviting you to spend ten minutes or less responding to an online survey at <http://estalink.us/survey>. Please write to protocolsatisfaction@esta.org with any questions or concerns.

ESTA's 2019 Plugfest dates announced

The ESTA Control Protocols Plugfest, the North American event where manufacturers and developers test their lighting products for network interoperability, is scheduled to take place from 19 to 21 July 2019 at the D/FW Marriott Solana in Westlake, Texas. This informal testing laboratory is offered free of charge to both ESTA and non-ESTA members.

ESTA's Plugfest is an opportunity to connect your lighting products with those of other manufacturers to test and resolve network compatibility challenges. Attendees bring controllers, intelligent lights, control protocol analyzers, and other network-connected components. People attend from around the world to pursue improvement of their customers' product experiences. The ESTA Plugfest has become a required step in many global manufacturers' product development roadmaps. The scheduled hours are 09:00-23:00 Friday thru Sunday. Members of the E1.11 (DMX512), E1.20 (RDM), E1.31 (sACN), and E1.33 (RDMnet) task groups who authored the standards will be available to answer questions and help explain our protocols.

An event information link can be accessed at <http://tsp.esta.org/tsp/news/plugfest.html>. For additional information, please contact the event organizers at plugfest@esta.org.

ANSI seeks private-sector participation for U.S.-China standards program

The American National Standards Institute, as part of its commitment to facilitate an open dialogue between the U.S. and China on standards and conformity assessment for greater market access, and as an effort to implement Phase V of the U.S.-China Standards and Conformity Assessment Cooperation Program (SCACP), is seeking industry member feedback. ANSI is currently seeking submissions from industry members to address pressing related industry concerns and commercial opportunities that are impacting the wellbeing of the standardization community.

ANSI welcomes feedback and workshop proposals for topics that may be addressed in relationship-building and knowledge sharing of best practices with Chinese counterparts. In order to receive priority consideration for workshops held in 2019, submissions should be received through us-chinasccp@ansi.org no later than 28 February 2019, Noon (EST). Later submissions will be reviewed on a rolling basis throughout the year.

In preparing a proposal, interested members should consider the following guidelines. The topics shall:

- Demonstrate a time-sensitivity of an issue that impacts mutual economic and commercial benefits, including export opportunities for U.S. goods and services;
- Translate a problem and its intended impact on areas that represent the greatest opportunity for growth in U.S. exports;
- Enable U.S.-China technical cooperation in the area of standards, technical regulations, and conformity assessment procedures;
- Focus on a common concern(s) that impacts a large business community domestically and globally.

The workshop proposal form and other information can be found on the [program website](http://www.standardsportal.org/us_chinascpp) (http://www.standardsportal.org/us_chinascpp). All other questions or feedback can be directed to us-chinascpp@ansi.org.

WTO Technical Barrier to Trade Notifications—for now

Notify US, the U.S. Department of Commerce's service to announce Technical Barrier to Trade filings, is on-line again, at least until the next threatened government shut-down on February 15. Some TBTs of note are listed below. Check them out while the website is still live!

If you have a problem with a TBTs, you can protest through your representative to the World Trade Organization. (So far the USA is still a member of the WTO.) See "Guidance for Comment Submissions by U.S. Industry on TBT Notifications" at <http://tsapps.nist.gov/notifyus/data/guidance/guidance.cfm> or <http://ec.europa.eu/growth/tools-databases/tbt/en/tbt-and-you/being-heard/> for advice on filing objections.

United States of America Notification USA/1353/USA

Date issued: 31 January 2019

Corrigendum type: Addendum

Correction type: Correction with full text

Corrigendum: TITLE: Bump-Stock-Type Devices

AGENCY: Bureau of Alcohol, Tobacco, Firearms, and Explosives; Department of Justice

ACTION: Final rule

SUMMARY: The Department of Justice is amending the regulations of the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) to clarify that bump-stock-type devices--meaning "bump fire" stocks, slide-fire devices, and devices with certain similar characteristics--are "machineguns" as defined by the National Firearms Act of 1934 and the Gun Control Act of 1968 because such devices allow a shooter of a semiautomatic firearm to initiate a continuous firing cycle with a single pull of the trigger. Specifically, these devices convert an otherwise semiautomatic firearm into a machinegun by functioning as a self-acting or self-regulating mechanism that harnesses the recoil energy of the semiautomatic firearm in a manner that allows the trigger to reset and continue firing without additional physical manipulation of the trigger by the shooter. Hence, a semiautomatic firearm to which a bump-stock-type device is attached is able to produce automatic fire with a single pull of the trigger. With limited exceptions, the Gun Control Act, as amended, makes it unlawful for any person to transfer or possess a machinegun unless it was lawfully possessed prior to the effective date of the statute. The bump-stock-type devices covered by this final rule were not in existence prior to the effective date of the statute, and therefore will be prohibited when this rule becomes effective. Consequently, under the final rule, current possessors of these devices will be required to destroy the devices or abandon them at an ATF office prior to the effective date of the rule. This rule is effective 26 March 2019.

Full text: https://members.wto.org/crnattachments/2019/TBT/USA/19_0565_00_e.pdf

Canada Notification CAN/576

Date issued: 24 January 2019

Agency responsible: Department of Innovation, Sciences and Economic Development

National inquiry point: Foreign Affairs, Trade and Development Canada

Products covered: Radiocommunications; Electromagnetic compatibility (EMC) including radio interference.

Title: Notice No. SMSE-17-18 - Release of ICES-005, Issue 5, Lighting Equipment, (1 page, available in English and French)

Description of content: Notice is hereby given by Innovation, Science and Economic Development Canada that the following has been published on its Web site: nterference-Causing Equipment Standard, ICES-005,

Issue 5, Lighting Equipment, sets out limits and methods of measurement of radiated and conducted radio frequency emissions produced by lighting equipment, as well as administrative requirements.

Objective and rationale: Spectrum Management

Relevant documents: Canada Gazette, Part I, 19 January 2019 (available in English and French).

Proposed date of adoption: Not given by country

Proposed date of entry into force: 17 December 2018

Final date for comments: 17 March 2019

Full text: [https://tsapps.nist.gov/notifyus/docs/wto_country/CAN/full_text/pdf/CAN576\(english\).pdf](https://tsapps.nist.gov/notifyus/docs/wto_country/CAN/full_text/pdf/CAN576(english).pdf)

Kuwait Notification KWT/458

Date issued: 31 January 2019

Agency responsible: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

National inquiry point: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

Products covered: All products fall under scope of KWS IEC 60034-1:2019; Rotating electrical machines - Part 1: Rating and performance

Title: Rotating electrical machines - Part 1: Rating and performance (222 pages, in English)

Description of content: Applicable to all rotating electrical machines except those covered by other IEC standards, for example, IEC 60349. Machines within the scope of this document may also be subject to superseding, modifying or additional requirements in other standards, for example, IEC 60079 and IEC 60092. This new edition contains a number of clarifications, corrections, and enhancements.

Objective and rationale: Protection of human health or safety

Relevant documents: IEC 60034-1:2017 RLV

Proposed date of adoption: Not given by country

Proposed date of entry into force: Not given by country

Final date for comments: 31 March 2019

Kuwait Notification KWT/462

Date issued: 31 January 2019

Agency responsible: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

National inquiry point: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

Products covered: All products fall under scope of KWS IEC 60950-1:2019; Information technology equipment - Safety - Part 1: General requirements

Title: Information technology equipment - Safety - Part 1: General requirements (648 pages, in English)

Description of content: Is applicable to mains-powered or battery-powered information technology equipment, including electrical business equipment and associated equipment, with a RATED VOLTAGE not exceeding 600 V. Also applicable are components and subassemblies intended for incorporation in information technology equipment. It is not expected that such components and subassemblies comply with every aspect of the standard, provided that the complete information technology equipment, incorporating such components and subassemblies, does comply.

Objective and rationale: Protection of human health or safety

Relevant documents: IEC 60950-1:2005+AMD1:2009+AMD2:2013

Proposed date of adoption: Not given by country

Proposed date of entry into force: Not given by country

Final date for comments: 31 March 2019

Kuwait Notification KWT/467

Date issued: 31 January 2019

Agency responsible: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

National inquiry point: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

Products covered: All products fall under scope of KWS IEC 60598-1:2019; Luminaires - Part 1: General requirements and tests

Title: Luminaires - Part 1: General requirements and tests (869 pages, in English)

Description of content: Specifies general requirements for luminaires, incorporating electric light sources for operation from supply voltages up to 1 000 V. The requirements and related tests of this standard cover: classification, marking, mechanical construction, electrical construction and photobiological safety. This eighth edition cancels and replaces the seventh edition published in 2008.

Objective and rationale: Protection of human health or safety

Relevant documents: IEC 60598-1:2014+AMD1:2017 CSV

Proposed date of adoption: Not given by country

Proposed date of entry into force: Not given by country

Final date for comments: 31 March 2019

Kuwait Notification KWT/469

Date issued: 31 January 2019

Agency responsible: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

National inquiry point: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

Products covered: All products fall under scope of KWS IEC 61558-1:2019; Safety of transformers, reactors, power supply units and combinations thereof - Part 1: General requirements and tests

Title: Safety of transformers, reactors, power supply units and combinations thereof - Part 1: General requirements and tests (556 pages, in English)

Description of content: Contains both the official IEC International Standard and its Redline version. The Redline version is not an official document, it is available in English only and provides you with a quick and easy way to compare all the changes between the official IEC Standard and its previous edition.

Objective and rationale: Protection of human health or safety

Relevant documents: IEC 61558-1:2017 RLV

Proposed date of adoption: Not given by country

Proposed date of entry into force: Not given by country

Final date for comments: 31 March 2019

Kuwait Notification KWT/450

Date issued: 31 January 2019

Agency responsible: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

National inquiry point: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

Products covered: All products fall under scope of KWS IEC 60065:2019; Audio, video and similar electronic apparatus - Safety requirements

Title: Audio, video and similar electronic apparatus - Safety requirements (340 pages, in English)

Description of content: Applies to electronic apparatus designed to be fed from the mains, from a supply apparatus, from batteries or from remote power feeding and intended for reception, generation, recording or reproduction of audio, video and associated signals. It also applies to apparatus designed to be used exclusively in combination with the above-mentioned apparatus

Objective and rationale: Protection of human health or safety

Relevant documents: IEC 60065:2014

Proposed date of adoption: Not given by country

Proposed date of entry into force: Not given by country

Final date for comments: 31 March 2019

Kuwait Notification KWT/453

Date issued: 31 January 2019

Agency responsible: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

National inquiry point: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

Products covered: All products fall under scope of KWS IEC 60309-4:2019; Plugs, socket-outlets and couplers for industrial purposes - Part 4: Switched socket-outlets and connectors with or without interlock

Title: Plugs, socket-outlets and couplers for industrial purposes - Part 4: Switched socket-outlets and connectors with or without interlock (45 pages, in English)

Description of content: Applies to self-contained products that combine within a single enclosure, a socket-outlet or connector according to IEC 60309-1 or IEC 60309-2 and a switching device, with a rated operating voltage not exceeding 1 000 V d.c. or a.c. and 500 Hz, and a rated current not exceeding 800 A, primarily intended for industrial use, either indoors or outdoors. These accessories are intended to be installed by instructed persons (Amendment 1:2001 of IEC 60050-195:1998, 195-04-02) or skilled persons (Amendment 1:2001 of IEC 60050-195:1998, 195-04-01) only. **Objective and rationale:** Protection of human health or safety

Relevant documents: IEC 60309-4:2006+AMD1:2012 CSV

Proposed date of adoption: Not given by country

Proposed date of entry into force: Not given by country

Final date for comments: 31 March 2019

Kuwait Notification KWT/455

Date issued: 31 January 2019

Agency responsible: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

National inquiry point: Public Authority for Industry, Kuwait Standards and Metrology Department (PAI/KUWSMD)

Products covered: All products fall under scope of KWS IEC 61534-21:2019; Powertrack systems - Part 21: Particular requirements for powertrack systems intended for wall and ceiling mounting

Title: Powertrack systems - Part 21: Particular requirements for powertrack systems intended for wall and ceiling mounting (21 pages, in English)

Description of content: Specifies the particular requirements and tests for PT systems intended for mounting on walls and/or ceiling. They may be installed flush or semi-flush, surface mounted, suspended or spaced away from the surface using fixing devices. This second edition cancels and replaces the first edition published in 2006 and constitutes a technical revision.

Objective and rationale: Protection of human health or safety

Relevant documents: IEC 61534-21:2014

Proposed date of adoption: Not given by country

Proposed date of entry into force: Not given by country

Final date for comments: 31 March 2019

Japan Notification JPN/619

Date issued: 31 January 2019

Agency responsible: Ministry of Economy, Trade and Industry (METI)

National inquiry point: Standards Information Service, International Trade Division, Economic Affairs Bureau, Ministry of Foreign Affairs (MOFA)

Products covered: Computers (HS: 8471.30, 8471.41, 8471.49, 8471.50) Other digital automatic data processing machines: (HS 84714), - Portable digital automatic data processing machines, weighing not more than 10 kg, consisting of at least a central processing unit, a keyboard and a display (HS 847130), - Digital processing units, other than those of subheading 8471.41 or 8471.49, whether or not containing in the same housing one or two of the following types of unit: storage units, input units, output units (HS 847150). Microprocessor systems.

Title: Revision to Notifications of the Ministry of Economy, Trade and Industry (METI) for the Act on the Rational Use of Energy (4 pages, in English)

Description of content: As the revision of the standards for judgement under the Act on the Rational Use of Energy, review energy consumption efficiency (fuel efficiency) standard for target fiscal year, measurement method, labelling requirement, etc. of the products listed in column 4.

Objective and rationale: Protection of the environment; Other; To promote rationalization of overall energy consumption in Japan through popularization of machineries and equipments with high energy consumption efficiency, in order to cope with the recent increase of energy consumption, global warming and so forth.

Relevant documents: • The Act on the Rational Use of Energy;

http://elaws.e-gov.go.jp/search/elawsSearch/elaws_search/lsg0500/detail?lawId=354AC0000000049

• The Cabinet Order for Enforcement of the Act on the Rational Use of Energy;

http://elaws.e-gov.go.jp/search/elawsSearch/elaws_search/lsg0500/detail?lawId=354CO00000000267

- The Ordinance of the Ministry of Economy, Trade and Industry for Enforcement of the Act on the Rational Use of Energy;
http://elaws.e-gov.go.jp/search/elawsSearch/elaws_search/lsg0500/detail?lawId=354M50000400074
 - This revision is to be published in the Official Government Gazette "Kanpo" when adopted.
- Proposed date of adoption:** Not given by country
Proposed date of entry into force: Not given by country
Final date for comments: 1 April 2019
Full text: [https://tsapps.nist.gov/notifyus/docs/wto_country/JPN/full_text/pdf/JPN619\(english\).pdf](https://tsapps.nist.gov/notifyus/docs/wto_country/JPN/full_text/pdf/JPN619(english).pdf)
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ANSI Public Review Announcements

The following documents have been announced for public review by ANSI. Please send your comments before the deadline to the person indicated and to ANSI's Board of Standards Review at psa@ansi.org.

Due 20 February 2019

BSR/NFPA 1300-201x, Standard on Community Risk Assessment and Community Risk Reduction Plan Development (new standard)

This standard shall have primary responsibility for requirements on the process to conduct a community risk assessment (CRA) and to develop, implement, and evaluate a CRR plan. Conducting a CRA and developing a CRR plan involve a community as defined by the AHJ. This standard contains minimum requirements for conducting a CRA, developing and implementing a CRR plan, and the ongoing evaluation of the CRR plan. This standard identifies strategic and policy issues involving the organization and deployment of a CRR program. Obtain an electronic copy from and offer comments at: www.nfpa.org/1300next

BSR/NFPA 55-201x, Compressed Gases and Cryogenic Fluids Code (revision of ANSI/NFPA 55-2016)

This code shall apply to the installation, storage, use, and handling of compressed gases and cryogenic fluids in portable and stationary cylinders, containers, equipment, and tanks in all occupancies. Obtain an electronic copy from and offer comments at: www.nfpa.org/55next

Due 11 March 2019

BSR/HFES 100-201x, Human Factors Engineering of Computer Workstations (new standard)

This standard covers operator-machine interface issues associated with computer workstations used regularly in offices (i.e., intentionally built indoor office workplaces) for text-, data-, and simple graphics-processing tasks. This standard applies to computer workstations for a wide range of users; in general, the physical dimensions and force requirements are designed to accommodate the North American population.

Single copy price: Free

Obtain an electronic copy from: <https://www.hfes.org/news/ansi-hfes-100-2019>

Send comments to: Steven Kemp, skemp@hfes.org

BSR/MHI ECMA 25-201X, AC Inverters for Use on Electric Overhead Monorail, and Gantry Graveling Cranes (new standard)

This standard applies to AC Inverters for use on electric overhead, monorail, and gantry traveling cranes. AC Inverters are also referred to as variable frequency drives, adjustable frequency drives, or variable speed drives.

Single copy price: \$25.00

Order from and send comments to: Patrick Davison, pdavison@mhi.org

BSR MH24.2-201x, Power-Operated Vertical Carousels and Vertical Lift Modules (revision of ANSI MH24.2-2016)

The purpose of this standard is to serve as a guide for designers, manufacturers, sellers, installers, users, and governing bodies associated with power-operated vertical carousels and vertical lift modules. The scope of this standard is to eliminate or minimize hazards which can arise during installation, start up, operation, maintenance, testing, and dismantling of power-operated vertical carousels and vertical lift modules.

Single copy price: \$25.00

Order from and send comments to: Patrick Davison, pdavison@mhi.org

BSR/NCMA ASD 1-201x, The Contract Management Standard (new standard)

The Contract Management Standard (CMS) reflects the combined knowledge of government and commercial buyers and sellers, as well as academicians, regulatory authorities, and consultants. The CMS is intended to be applied by contract managers using the judgment required to adapt to any unique circumstances of the reader. Consequently, the CMS provides guidance to the contract management profession without restricting technological advancement or freedom to operate. The CMS describes the nature of contract management in terms of the contract management processes created through the integration and interaction of job tasks and competencies, and the purposes they serve.

Single copy price: Free

Obtain an electronic copy from: Standards@NCMAHQ.org

Send comments to: John Wilkinson, jwilkinson@thinc-llc.com

Due 18 March 2019

BSR/ASSP Z490.2-201X, Accepted Practices for E-learning in Safety, Health and Environmental Training (new standard)

This standard establishes criteria for safety, health and environmental virtual training programs, including program management, development, delivery, evaluation, and documentation. The purpose of this standard is to provide criteria for accepted practices for safety, health, and environmental training programs including development, delivery, evaluation, and program management, which are delivered via virtual means. This standard is recommended for application by virtual training providers of safety, health, and environmental training. If any of the provisions of this standard are not applicable, the other requirements of the standard shall still apply. This standard applies to all occupational safety, health, or environmental training, whether separate or a part of other training being given on a virtual basis.

Single copy price: \$110.00

Order from and send comments to: LBauerschmidt@assp.org

BSR/AWS D14.4/D14.4M-201X, Specification for the Design of Welded Joints in Machinery and Equipment (revision of ANSI/AWS D14.4/D14.4M-2012)

This specification establishes common acceptance criteria for classifying and applying carbon and low-alloy steel welded joints used in the manufacture of machines and equipment. It also covers weld joint design, workmanship, quality control, nondestructive testing, repair of weld defects, and postweld treatment.

Single copy price: \$40.50

Obtain an electronic copy from and send comments to: Kevin Bulger; kbulger@aws.org

BSR/BICSI 009-201x, Data Center Operations and Maintenance Best Practices (new standard)

This standard provides requirements, recommendations, and best practices for the operation and maintenance of data centers including but not limited to standard operating procedures, emergency operating procedures, maintenance, governance, and management.

Single copy price: Free

Obtain an electronic copy from and send comments to: jsilveira@bicsi.org

Due 25 March 2019

BSR/AGMA 6034-CXX-201x, Practice for Enclosed Cylindrical Wormgear Speed Reducers and Gearmotors (revision and redesignation of ANSI/AGMA 6034-B92-2010 (R2016))

This standard applies to the rating and design of enclosed cylindrical wormgear speed reducers and gearmotors having either solid or hollow output shafts and single or multiple reductions that may include other types of gearing used in conjunction with cylindrical wormgearing. The rating and design considerations are valid for worm rotational speeds not greater than 3600 rpm and mesh sliding velocities not more than 6000 ft/min.

Single copy price: \$60.00

Order from: tech@agma.org

Send comments to: aboutaleb@agma.org

BSR/ASHRAE Addendum 62.1s-201x, Ventilation for Acceptable Indoor Air Quality (addenda to ANSI/ASHRAE Standard 62.1-2016)

The ventilation rate procedure in 62.1-2016 contains requirements in notes. This proposed addendum relocates requirements to the body of the standard. Another proposed change is to clarify that in the presence of unusual

sources the rates in the VRP must be supplemented by additional ventilation to be determined by the IAQ procedure or an EHS professional. The default values per person in Table 6.2.2.1 (Minimum Ventilation Rates in Breathing Zone) do not contain any adjustments for Ev and in many cases are taken out of context. They are not used in the ventilation calculations. These values are deleted.

Single copy price: \$35.00

Free download at <https://www.ashrae.org/technical-resources/standards-and-guidelines/public-reviewdrafts>

Send comments to Online Comment Database: <https://www.ashrae.org/technical-resources/standardsand-guidelines/public-review-drafts>

BSR/AWS J1.3M/J1.3-201x, Specification for Materials Used in Resistance Welding Electrodes and Tooling (new standard)

This standard specifies essential properties of materials used for resistance welding electrodes and related components, the common applications of these materials, and methods of conformance verification.

Single copy price: \$35.00

Order from and send comments to: Mario Diaz, mdiaz@aws.org

BSR/AWS C1.5-201X, Specification for the Qualification of Resistance Welding (revision of ANSI/AWS C1.5-2015)

This specification for the qualification of resistance welding technicians was developed to provide a qualification basis, which defines minimum requirements for a resistance welding technician to demonstrate competence.

Single copy price: \$25.00

Order from and send comments to: Mario Diaz, mdiaz@aws.org

BSR/ICC 1100-201x, Standard for Spray-Applied Polyurethane Foam Plastic Insulation (new standard)

Construction codes have requirements for thermal resistance of insulating materials but currently include limited material standards for certain types of insulating materials. The purpose is to develop a performance standard based upon existing ICC-ES Acceptance Criteria and related documents for spray-applied foam plastic insulation for use by industry and possible inclusion in construction codes.

Single copy price: Free

Obtain an electronic copy from: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/standardsdevelopment/is-fpi/>

Send comments to: Karl Aittaniemi, kaittaniemi@iccsafe.org

BSR/NFPA 557-201x, Standard for Determination of Fire Loads for Use in Structural Fire Protection Design (revision of ANSI/NFPA 557-2016)

The scope of this standard is the determination of the fire load and fire load density to be used as the basis for the evaluation and design of the structural fire performance of a building.

Obtain an electronic copy from and offer comments at: www.nfpa.org/557next

BSR/NFPA 654-201x, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids (revision of ANSI/NFPA 654-2017)

This standard provides requirements for all phases of the manufacturing, processing, blending, conveying, repackaging, and handling of combustible particulate solids or hybrid mixtures, regardless of concentration or particle size, where the materials present a fire, a flash fire, or an explosion hazard.

Obtain an electronic copy from and offer comments at: www.nfpa.org/654next

CSA Public Review Announcements

The CSA Group has announced a draft for public review that might be of interest to *Standards Watch* readers. To participate in CSA public reviews, please visit: <http://publicreview.csa.ca/>.

Due 22 March 2019

C22. 2 No. 35 Extra-low-voltage control circuit cable, low-energy control cable, and extra-low-voltage control cable (new edition)

This standard specifies requirements for the following types of control cables, rated 30 V maximum, intended for use in extra-low-voltage control circuits in accordance with the rules of the Canadian Electrical Code, Part I:

- (a) Type LVT extra-low-voltage control circuit cables, rated 60 °C maximum;
- (b) Low-Energy Control Cables, rated 105 °C maximum;
- (c) Type ELC extra-low-voltage control cables, rated 60 °C maximum; and
- (d) Type GCS golf course and Type LSS lawn sprinkler , Type LVLL low-voltage landscape lighting, and Type ULEC underground low-energy circuit cables, rated 60 °C maximum.

Due 26 March 2019

IEC 61000-4-1, Electromagnetic compatibility (EMC) - Part 4-1: Testing and measurement techniques - Overview of IEC 61000-4 series (new edition)

This part of IEC 61000 gives information and guidance on the EMC basic standards and other basic EMC documents published in the IEC 61000-4 series. Those basic standards describe mainly immunity tests to be considered and applied for electric and electronic equipment, including systems.

The object of this part of IEC 61000 is to give assistance to the technical committees of IEC or other bodies, users and manufacturers in

- considering the immunity test methods applicable to their products;
- determining the immunity test methods relevant for the electromagnetic environment in which their products are intended to be used;
- specifying the ports of their products being subjected to the relevant immunity test methods.

Due 4 April 2019

Z240.10.1-16, Site preparation, foundation, and installation of buildings (amendment)

This standard specifies general requirements for manufactured homes, including technical requirements, and requirements on quality control, markings, and provision of printed instructions.

Due 12 April 2019

C22.1, Amendment - Canadian Electrical Code, Part I, Subject No. 4416, Deletion of 30-500 series of Rules. (amendment)

Delete Rules 30-500 through 30-510, and associated Appendix G references, thus deleting the requirements for luminaires in residential occupancies from the CEC. The argument is that these rules are better covered in the NBC, and there can be no conflict if the rules are in one place. Some of the provinces have already deleted these clauses from their local adoptions of the Canadian Electrical Code.

C22.1, Amendment - Canadian Electrical Code, Part I, Subject No. 4417, Reduction of spacing between cable bundles for Class 2 power and data communication circuits. (amendment)

Revise Rule 16-330 so spacing is reduced from 25 mm to 15 mm.

DIN Public Review Announcement

The Deutsches Institut für Normung has announced a draft document possibly of interest to *Standards Watch* readers. After you register with DIN at <http://www.entwuerfe.din.de/>, you may purchase and comment on DIN draft standards. This document will be available for public review until 2019-04-08 and cost s76.80 € from Beuth Verlag. The document is in German.

DIN SPEC 56951, Veranstaltungstechnik - Antrieb und Steuerung für sicherheitstechnische Einrichtungen (Entertainment Technology - Drives and control systems for safety-related equipment)

This DIN SPEC is specifies additional provisions and explanations to DIN 56950-1 for protective and safety equipment. The DIN website page announcing the public review gives examples of these “additional provisions” as applying to non-fan-powered smoke extraction systems and protective fire safety curtains for the stage and side stages. However, a perusal of the table of contents shows that it also covers devices for safely holding loads above persons and braking devices for lowering loads—more than fire safety curtains and smoke vents.

New ANS Projects

ANSI has announced the following new projects that might materially affect *Standards Watch* readers—or at least be interesting to them. Contact the developer if you (a) want to be involved in the project, (b) object to the

project and wish it to be abandoned, or (c) if you would like to point out that its scope is covered by an existing standard, thereby possibly making the project redundant or conflicting.

BSR A14.2-201x, Ladders - Portable Metal - Safety Requirements (revision of ANSI A14.2-2017)

This standard prescribes rules governing the safe construction, design, testing, care, and use of portable metal ladders of various types and styles. Ladder styles include ladder-type step stools, portable extension, step, trestle, sectional, combination, single, platform, articulating, articulating extendable, and telescoping ladders, but excluding ladders in and on mines, the fire services, mobile equipment, hoisting equipment, work platforms, antenna communications towers, transmission towers, utility poles, and chimneys. It does not cover special-purpose ladders that do not meet the general requirements of this standard.

Contact: Pam O'Brien, info@americanladderinstitute.org

BSR A14.5-201x, Ladders - Portable Reinforced Plastic - Safety Requirements (revision of ANSI A14.5-2017)

This standard prescribes rules governing the safe construction, design, testing, care and use of portable reinforced plastic ladders of various types and styles. Ladder styles include ladder-type step stools, portable extension, step, trestle, sectional, combination, single, platform, articulating, and articulating extendable ladders, but excluding ladders in and on mines, the fire services, mobile equipment, hoisting equipment, work platforms, antenna communications towers, transmission towers, utility poles, and chimneys. It does not cover special-purpose ladders that do not meet the general requirements of this standard.

Contact: Pam O'Brien, info@americanladderinstitute.org

BSR/ASHRAE Standard 227-201x, Passive Building Design Standard (new standard)

The climate-specific passive house approach delivers an exceptionally energy-efficient and cost-effective building. The purpose of this proposed standard is to develop a codemandatory language version of the passive house guideline. Such a standard would allow greater diffusion of passive house energy efficiency into the marketplace (via code adoptions), permit the approach to be ANSI certified, and support ASHRAE's involvement in the residential building sector. This standard provides requirements for the design of buildings that have exceptionally low energy usage and that are durable, resilient, comfortable, and healthy.

Contact: Steven Ferguson, sferguson@ashrae.org

BSR/ASHRAE Standard 228-201x, Standard Method of Evaluating Zero Energy Building (new standard)

This standard sets requirements for evaluating whether a building or group of buildings meets a definition of "zero energy". It provides a consistent method of expressing qualifications for zero energy buildings associated with the design of new buildings and the operation of existing buildings.

Contact: Steven Ferguson, sferguson@ashrae.org

BSR/ASSP A10.44-201X, Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations (revision of ANSI/ASSE A10.44-2014)

This standard establishes the minimum requirements for the control of energy sources to prevent release of harmful energy that could cause death, injury, or illness to people performing construction and demolition work.

Contact: Tim Fisher, TFisher@ASSP.org

BSR/AWS B2.1/B2.1M-201x, Specification for Welding Procedure and Performance Qualification (revision of ANSI/AWS B2.1/B2.1M-2013)

This specification provides the requirements for qualification of welding procedure specifications, welders, and welding operators for manual, semiautomatic, mechanized, and automatic welding. The welding processes included are electrogas welding, electron beam welding, electroslag welding, flux-cored arc welding, gas metal arc welding, gas tungsten arc welding, laser beam welding, oxyfuel gas welding, plasma arc welding, shielded metal arc welding, stud arc welding, and submerged arc welding. Base metals, filler metals, qualification variables, welding designs, and testing requirements are also included.

Contact: Jennifer Rosario, jrosario@aws.org

BSR/B11.TR9-201x (ISO/TR 22100-4-2018 IDT), Guidance to Machinery Manufacturers for Consideration of Related IT-Security (Cyber Security) Aspects (identical national adoption of ISO/TR 22100-4:2018)

This document gives machine manufacturers guidance on potential security aspects and relation to safety of

machinery when putting a machine into service or placing on the market for the first time. It provides essential information to identify and address IT-security threats which can influence safety of machinery.

Contact: Chris Felinski, cfelinski@b11standards.org

BSR/RESNA ED-1-201x, RESNA Standard for Evacuation Devices - Volume 1: Emergency Stair Travel Devices used by Individuals with Disabilities (revision of ANSI/RESNA ED-1-2013)

This RESNA ED-1 standard covers the terminology, description, performance, inspection, and maintenance of devices whose primary purpose is the travel of individuals with disabilities over stair and horizontal surfaces during building evacuations. This standard does not cover devices whose purpose is the travel of individuals with disabilities during routine travel on stairs. This standard includes requirements and test methods for determining emergency stair travel device performance. It also includes requirements for the disclosure of the test results.

Contact: Yvonne Meding, YMeding@resna.org

BSR/UL 3005-201x, Standard for Safety for Distributed Energy Resource Management Systems (new standard)

Safety of distributed energy resource management systems (DERMS) comprised of systems that coordinate operation of individual distributed energy resources (DERs) such as PV arrays or wind turbines in homogenous or hybrid configurations, energy storage systems; grid interfaces; premises wiring systems; and related equipment. DERMS oversee functionality of the distributed energy system in multiple modes of operations (e.g., on grid or off grid), support grid and premises systems operation, and coordinate operation of the integrated energy assets. These requirements cover the safety of DERMS design, integration, and operation as it relates to the operation of the DERs and interfaces with grid and premises wiring systems.

Contact: Susan Malohn, Susan.P.Malohn@ul.com

Final Actions on American National Standards

The documents listed below have been approved by the ANSI Board of Standards Review or by an ANSI-Audited Designator on the date noted.

ANSI E1.48-2014 (R2019), A Recommended Luminous Efficiency Function for Stage and Studio Luminaire Photometry (reaffirmation of ANSI E1.48-2014): 1 February 2019

ANSI/AGMA 6001-F-2019, Design and Selection of Components for Enclosed Gear Drives (revision and redesignation of ANSI/AGMA 6001-E-2008 (R2014)): 18 January 2019

ANSI/AGMA 6025-E-2019, Sound for Enclosed Helical, Herringbone and Spiral Bevel Gear Drives (revision and redesignation of ANSI/AGMA 6025-D98 (R2016)): 18 January 2019

ANSI/AWS C1.1M/C1.1-2019, Recommended Practices for Resistance Welding (revision of ANSI/AWS C1.1M/C1.1-2012): 18 January 2019

ANSI/CTA/CEDIA 2030-A-2011 (R2019), Multi-Room Audio Cabling Standard (reaffirmation of ANSI/CTA/CEDIA 2030-A-2011): 1 February 2019

ANSI/IES RP-16-2017, Addendum 2-2019, Nomenclature and Definitions for Illuminating Engineering - Addendum 2: New and Modified Terms (addenda to ANSI/IES RP-16-2017 and ANSI/IES RP-16-2017, Addendum 1-2018): 29 January 2019

ANSI/RESNA WC-3-2018, RESNA Standard for Wheelchairs - Volume 3: Wheelchair Seating (national adoption of ISO 16840-2, ISO 16840-3, ISO 16840-6, ISO TS 16840-12 with modifications and revision of ANSI/RESNA WC-3-2013): 16 January 2019

ANSI/UL 60034-5-2019, Rotating Electrical Machines - Part 5: Degrees of Protection Provided by the Integral Design of Rotating Electrical Machines (IP Code) - Classification (identical national adoption of IEC 60034-5): 14 January 2019

INCITS/ISO/IEC 1539-1:2010 [R2018], Information technology - Programming languages - Fortran - Part 1: Base language (reaffirm a national adoption INCITS/ISO/IEC 1539-1:2010 [2013]): 31 December 2018

INCITS/ISO/IEC 8859-1:1998 [R2018], Information technology - 8-bit single-byte coded graphic character sets - Part 1: Latin alphabet No. 1 (reaffirm a national adoption INCITS/ISO/IEC 8859-1:1998 [R2013]): 31 December 2018

INCITS/ISO/IEC 8859-4:1998 [R2018], Information technology - 8-bit single-byte coded graphic character sets - Part 4: Latin alphabet No. 4 (reaffirm a national adoption INCITS/ISO/IEC 8859-4:1998 [R2013]): 31 December 2018

INCITS/ISO/IEC 8859-7:2003 [R2018], Information technology - 8-bit single-byte coded graphic character sets - Part 7: Latin/Greek alphabet (reaffirm a national adoption INCITS/ISO/IEC 8859-7:2003 [R2013]): 31 December 2018

INCITS/ISO/IEC 8859-10:1998 [R2018], Information technology - 8-bit single-byte coded graphic character sets - Part 10: Latin alphabet No. 6 (reaffirm a national adoption INCITS/ISO/IEC 8859-10:1998 [R2013]): 31 December 2018

INCITS/ISO/IEC 8859-11:2001 [R2018], Information technology - 8-bit single-byte coded graphic character sets - Part 11: Latin/Thai alphabet (reaffirm a national adoption INCITS/ISO/IEC 8859-11:2001 [R2013]): 31 December 2018

INCITS/ISO/IEC 8859-13:1998 [R2018], Information technology - 8-bit single-byte coded graphic character sets - Part 13: Latin alphabet No. 7 (reaffirm a national adoption INCITS/ISO/IEC 8859-13:1998 [R2013]): 31 December 2018

INCITS/ISO/IEC 8859-14:1998 [R2018], Information technology - 8-bit single-byte coded graphic character sets - Part 14: Latin alphabet No. 8 (Celtic) (reaffirm a national adoption INCITS/ISO/IEC 8859-14:1998 [R2013]): 31 December 2018

INCITS/ISO/IEC 8859-15:1999 [R2018], Information technology - 8-bit single-byte coded graphic character sets - Part 15: Latin alphabet No. 9 (reaffirm a national adoption INCITS/ISO/IEC 8859-15:1999 [R2013]): 31 December 2018

INCITS/ISO/IEC 8859-9:1999 [R2018], Information technology - 8-bit single-byte coded graphic character sets - Part 9: Latin alphabet No. 5 (reaffirm a national adoption INCITS/ISO/IEC 8859-9:1999 [R2013]): 31 December 2018

Draft IEC & ISO Documents

This section lists proposed documents that the International Electrotechnical Commission (IEC) or the International Organization for Standardization (ISO) are considering for approval. *Standards Watch* readers interested in reviewing and commenting on a document should order a copy from their national representative and submit their comments through them. Comments from US citizens on IEC and ISO documents should be sent to Charles T. Zegers at czegers@ansi.org and Karen Hughes at isot@ansi.org respectively. Any prices, if shown, are for purchases through ANSI. The sort order is by due date then alphanumeric.

ISO/DIS 20887, Sustainability in buildings and civil engineering works - Design for disassembly and adaptability - Principles, requirements and guidance, 24 February 2019, \$112.00

ISO/IEC/IEEE DIS 21840, Systems and software engineering - Guidelines for the utilization of ISO/IEC/IEEE 15288 in the context of System of Systems (SoS), 25 February 2019, \$125.00

31/1444A/CD, IEC 62990-3 ED1: Workplace atmospheres - Part 3: Gas detectors - Electrical apparatus for the detection and measurement of oxygen - Performance requirements and test methods, 8 March 2019

65C/942/FDIS, IEC 61784-1 ED5: Industrial communication networks - Profiles - Part 1: Fieldbus profiles, 8 March 2019

65C/943/FDIS, IEC 61784-2 ED4: Industrial communication networks - Profiles - Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC/IEEE 8802-3, 8 March 2019

65C/947/FDIS, IEC 61158-5-X ED4: Industrial communication networks - Fieldbus specifications - Part 5-X: Application layer service definition - Type X elements, 8 March 2019

65C/945/FDIS, IEC 61158-3-X ED4: Industrial communication networks - Fieldbus specifications - Part 3 - X: Data-link layer service definition - Type X elements, 8 March 2019

65C/946/FDIS, IEC 61158-4-X ED4: Industrial communication networks - Fieldbus specifications - Part 4 - X: Data-link layer protocol specification - Type x elements, 8 March 2019

65C/948/FDIS, IEC 61158-6-X ED4: Industrial communication networks - Fieldbus specifications - Part 6-X: Application layer protocol specification - Type X elements, 8 March 2019

65C/944/FDIS, IEC 61158-1 ED2: Industrial communication networks - Fieldbus specifications - Part 1: Overview and guidance for the IEC 61158 and IEC 61784 series, 8 March 2019

65A/911/DTR, Functional safety - Safety instrumented systems for the process industry sector - Part 4: Explanation and rationale for changes in IEC 61511-1 from Edition 1 to Edition 2, 22 March 2019

65C/949/CD, IEC 60802 ED1: Time-sensitive networking profile for industrial automation, 22 March 2019

ISO/DIS 21982, Assembly tools for screws and nuts – Ratcheting wrenches - Technical requirements, 14 April 2019, \$58.00

ISO/DIS 22396, Security and resilience - Community resilience - Guidelines for information exchange between organizations, 22 April 2019, \$62.00

Recently Published IEC & ISO Documents

Listed here are documents recently approved by the IEC or ISO. Prices are if bought from ANSI.

IEC 60947-SER Ed. 1.0 b:2019, Low-voltage switchgear and controlgear - ALL PARTS, \$7347.00

IEC 62680-1-3 Ed. 3.0 b:2018, Universal Serial Bus interfaces for data and power - Part 1-3: Common components - USB Type-C™ Cable and Connector Specification, \$410.00

IEC 62680-1-4 Ed. 1.0 b:2018, Universal Serial Bus interfaces for data and power - Part 1-4: Common components - USB Type-C™ Authentication Specification, \$352.00

IEC 62902 Ed. 1.0 b:2019, Secondary cells and batteries - Marking symbols for identification of their chemistry, \$117.00

IEC/TR 61000-1-8 Ed. 1.0 en:2019, Electromagnetic compatibility - Part 1-8: Phase angles of harmonic current emissions and voltages in the public supply networks - Future expectations, \$352.00

IEC/TR 63194 Ed. 1.0 en:2019, Guidance on colour coding of optical fibre cables, \$235.00

ISO 19427:2019, Steel wire ropes - Pre-fabricated parallel wire strands for suspension bridge main cable - Specifications, \$103.00

ISO 20740:2019, Martial arts - Wushu Taiji sword - Requirements and test method, \$68.00

ISO 8102-6:2019, Electrical requirements for lifts, escalators and moving walks - Part 6: Programmable electronic systems in safety related applications for escalators and moving walks (PESSRAE), \$138.00

ISO/IEC 23008-9:2019, Information technology - High efficiency coding and media delivery in heterogeneous environments - Part 9: 3D Audio conformance testing, \$232.00

ISO/IEC 23090-2:2019, Information technology - Coded representation of immersive media - Part 2: Omnidirectional media format, \$232.00

ISO/IEC 27018:2019, Information technology - Security techniques - Code of practice for protection of personally identifiable information (PII) in public clouds acting as PII processors, \$138.00

TSP Meeting Schedule

The most up to date schedule sorted by day is available at <http://www.esta.org/>. The following meetings will be at the Hyatt Regency Louisville, in conjunction with the USITT Conference:

Electrical Power Working Group	11:00 – 14:00	Friday 22 March 2019
Event Safety Fire Safety Task Group	14:00 – 18:00	Saturday 23 March 2019
Event Safety Working Group	14:00 – 18:00	Saturday 23 March 2019
Floors Working Group	14:00 – 17:00	Wednesday 20 March 2019
Followspot Position Working Group	19:00 – 22:00	Friday 22 March 2019
Rigging Working Group	19:00 – 22:00	Thursday 21 March 2019
Stage Machinery E1.64 TG	09:00 – 13:00	Wednesday 20 March 2019
Stage Machinery Working Group	14:00 – 17:00	Thursday 21 March 2019
Technical Standards Council	15:00 – 18:00	Friday 22 March 2019

TSP Donors Who Have Made Long-Term, Multi-Year Pledges

About the Stage
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 InCord
 Beverly and Tom Inglesby
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 InterAmerica Stage
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Lycian Stage Lighting
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 McLaren Engineering Group
 Mike Garl Consulting
 Mike Wood Consulting
 Morpheus Lights
 NAMM
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Rose Brand

German Light Products

Stage Rigging

JR Clancy

TMB

McLaren Engineering Group

Tyler Truss Systems, Inc.

VISIONARY (\$500 & up; <20 employees/members)

About the Stage

Link

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Scott Blair

Mike Garl Consulting

Boston Illumination Group

Mike Wood Consulting

Louis Bradfield

Power Gems

Candela Controls Inc.

Reed Rigging

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Interactive Technologies

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IATSE Local 891

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H&H Specialties, Inc.

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Indianapolis Stage Sales & Rentals, Inc.
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Qdot Lighting Ltd.
Robert Scales
Stephen Vanciel
Suga Koubou Co., Ltd.
VU-Industry Vision Technology
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Thern Stage Equipment
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Guangzhou YaFeng Optoelectronic Equipment Co.
High Output
InCord
iWeiss
LA ProPoint, Inc.
Nanshi Lighting

Oasis Stage Werks
Stage Equipment & Lighting
Stagemaker
Taurus Light Co. Ltd.
Thermotex Industries, Inc.
Vincent Lighting Systems
Zhuhai Shengchang Electronics Co.

SUPPORTER (<\$200; <20 employees/members)

Roy Bickel
DMX Pro Sales
Tony Giovannetti
Pat Grenfell
Mitch Hefter
John Huntington
Beverly and Tom Inglesby
Eddie Kramer
Jason Kyle

LuxBalance Lighting
Tyrone Mellon, Jr.
Lizz Pittsley
Showman Systems
Michael Skinner
Skjonberg Controls Inc.
Stage Labor of the Ozarks
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ESTA Standards Watch

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