

Summary of BSR E1.51 Fifth Public Review Comments and Reasons

Referenced document:

BSR E1.51 - 201x, The Selection, Installation, and Use of Single-Conductor Portable Power Feeder Cable Systems for Use at 600 Volts Nominal or Less for the Distribution of Electrical Energy in the Television, Film, Live Performance and Event Industries in Canada (document number EP/2012-7009r7)

ANSI public review period: 17 June 2016 through 1 August 2016

Question:

Do you recommend that the standards committee accept BSR E1.51-201X (document number EP/2012-7009r7), as an American National Standard, that its requirements are reasonable, neither too lax nor onerous, and that it would not unreasonably negatively impact materially affected parties in the entertainment industry? Please indicate "Yes" (accept it), "Yes with comments," or "No with reasons" (don't accept it).

Commenters and their responses:

Name	Company or organization	Yes	Yes with comments	No with reasons
Matt Antonucci (MA)	Contract Services Administration Trust Fund			X
Rob Baxter (RB)	Baxter Controls, Inc.			X
James Eade (JE)	ABTT		X	
Lance Hughston, Sr. (LH)	Hughston Engineering, Inc.			X
Eddie Kramer (EK)	1501			X
Phil Reilly (PR)	WGBH Television			X
Alan Rowe (AR)	IATSE Crafts Advancement Program			X
Keith Woods (KW)	IATSE 891 / Laakri Impressions, Ltd.			X

Reasons from two commenters were identical and have been listed under the same comment numbers, noting that there were two commenters. All comments and reasons offered on the pages that follow.

#	Cmmntr	Clause	Comment or reason	Proposed resolution
1	MA	Administrative	<p><u>Administrative</u></p> <p>This section should include a statement that all portable power distribution equipment shall only be installed, operated, and disassembled by Qualified Personnel. The use of Qualified Personnel is the integral part of what makes these systems safe and efficient and is required in all jurisdictions.</p> <p><i>Insert: "Electrical equipment for the entertainment industry, including cordsets, shall only be installed, connected, energized, operated, and uninstalled by Qualified Personnel."</i></p>	Make no change. We already require the system to be inspected by qualified personnel before being energized.
2	AR	Administrative	<p><u>Administrative</u></p> <p>This section should include a statement that all portable power distribution equipment shall only be installed, operated, and disassembled by Qualified Personnel. The use of Qualified Personnel is the integral part of what makes these systems safe and efficient and is required in all jurisdictions.</p> <p><i>Insert: "Electrical equipment for the entertainment industry, including cordsets, shall only be installed, connected, energized, operated, and uninstalled by Qualified Personnel."</i></p>	Make no change. See resolution to comment #1.
3	PR	Administrative	<p>Administrative – Beyond the steps that manufactures take to build safe components, what makes these portable systems safe are the technicians (qualified personnel) that design and assemble the distribution system.</p> <p>Insert: "Portable electrical equipment for the entertainment industry, including cordsets, shall only be installed, energized, operated, and disassembled by Qualified Personnel."</p>	Make no change. See resolution to comment #1.
4	RB	Administrative	<p>Administrative – I strongly disagree with the requirement for filing an application for "all...events". This is too burdensome and arguably unnecessary for many bon-a-fide events and productions. There should instead be an implied and/or administrative automatic permit based on the event type</p>	<p>Make no change. Required actions are common permitting instructions.</p> <p><i>[TSM note: Suggest removing this clause entirely, and leaving it up to the local authority having jurisdiction to</i></p>

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			(i.e; indoor vs. outdoor, theatre vs. arena, public or private) and in particular, the use and presence of "Qualified Personnel" to install and therefore "permit" the system. The basis for determining "Qualified Personnel" should be significant enough to carry some form of automatic "permit status" with it for certain types events or productions, but not all. Otherwise, what is the point of having "Certified/Qualified Personnel?" Change language to read: "Production shall follow all permitting instructions of the local AHJ."	<i>decide what types of events need permits and inspections. However this change would be substantive and would trigger another public review.]</i>
5	JE	Definitions	Consider aligning definitions with the IEC electrotechnical vocabulary (e.g. 'bond', 'bonding' etc) so it's consistent across standards: see www.electropedia.org	Make no change. The document needs to be consistent with the Canadian Electrical Code. The intended audience will be using this document and the CEC, not this document and the multi-part IEC 60050.
6	EK	Definitions	Ampacity Ampacity: is the current carrying capacity of electrical conductors expressed in amperes A #12 conductor can carry over 100 A, maybe not safely, but there is nothing about safety in the definition "Rewrite, using the NFPA definition; ""The current, in amperes, that a conductor can carry continuously under the conditions of use without exceeding its temperature rating.""	Accept.
7	EK	Definitions	Box connector Box connector: a device for securing a cable, via its sheath or armour... "Type SC, SCE, and SCT (and others) have a Jacket instead of a sheath or armour. Armour is misspelled" "Respell Armor Add ""Jacket"" before ""sheath or armour""	Make no change. The spellings are standard Canadian English. "Sheath" would be understood to be the outside protective cover, what someone in the USA might call a "jacket."
8	EK	Definitions	Certified person Certified person: a holder of a valid certificate of qualification A drivers licenses is a certificate of qualification, but it does not qualify the holder to do electric work. In the proper place in the definition of certified person, add "appropriate"	Make no change. "Valid" means "Acceptable, proper or correct."
9	EK	Definitions	Conductor Conductor: a wire or cable, or other form of metal There are non-metallic conductors "Rewrite, using the IEEE definition; ""Conductor: A material, usually in the form of a wire, cable,	Make no change. In the context of single-conductor portable power feeder cable, a conductor is metallic wire. The definitions section of a standard only defines words in relation to the standard. It is not a dictionary.

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			or bus bar, suitable for carrying an electric current."""	
10	EK	Definitions	<p>Dimmer Definition Dimmer: a device used to regulate the intensity of a luminaire.</p> <p>When multiple units are encased together the result is referred to as a dimmer pack or dimmer rack.</p> <p>"A) ""used to regulate the intensity of a luminaire"" LED brightness can be controlled W/O a dimmer, likewise ARC moving lights, and on a film set Flags & Scrims are used to control the output of the unit</p> <p>B) ""dimmer pack or dimmer rack"" AKA a Switchboard"</p> <p>"Rewrite; Dimmer: a device used to regulate the intensity of a Incandescent luminaire. When multiple units are encased together the result is referred to as a switchboard, dimmer pack or dimmer rack."</p>	Make no change. If the LED luminaires have variable output, their power supplies have dimming circuitry built-in. In the context of single-conductor portable power feeder cable, we do not need to describe all the different types of dimmers that exist, such as neutral density gel, scrims, and flags.
11	KW	Definitions	<p>Feeder-the existing language is totally incomprehensible. Suggest using the language from the code:</p> <p><i>“any portion of an electrical circuit between the service box or other source of supply and the branch circuit overcurrent devices”</i></p> <p>Or if that is not to your liking, how about:</p> <p><i>“colloquial term often used, that refers to the cable used in a power distribution system in the industries covered by the scope of this document”</i></p>	Accept first definition.
12	EK	Definitions	<p>Grounded Definition Grounded (neutral, identified) conductor: One current carrying conductor of a ...</p> <p>A Neutral may not be carrying current. Grounded (neutral, identified) conductor: One current carrying conductor of a service entrance, transformer or generator service which may be current carrying and is intentionally bonded ...</p>	Make no change. It is true that a neutral might not be carrying current in a multi-phase system if the system is perfectly balanced and the loads are linear, creating no harmonics. However, this is rarely the case in portable power feeder systems used for events. In the context of offering guidance for the setup and use of a single-conductor portable power feeder cable system in the entertainment industry in Canada, it is better to assume that it will be carrying current.
13	RB	Definitions	Grounding Electrode – Metal water piping systems are not always not suitable since many modern plumbing systems	Make no change. Three meters is contact length that will often work, but the exact length is irrelevant. The

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			use PVC underground and it is not visible. Insert: "All grounding or pipe systems must be assured of having 3m or more subterranean contact with Earth."	important requirement is that the impedance to earth be low, and that is already written into the definition of "Grounded."
14	KW	Definitions	Grounding electrode-this definition needs to be cleaned up as the definition is repeated for some reason. Also, even though the CEC does state that a metal water-piping system is acceptable, I wonder if that part should be removed, as there are very few water-piping systems that are metal now, most are PVC in new construction, or retrofits to existing systems.	Make no change. The CEC says that metal water-piping is acceptable. It might be harder to find now, but it is still acceptable.
15	MA	Definitions	<p><u>Grounding Electrode</u></p> <p>The proposed standard uses the language directly out of the CEC but metal water piping systems are generally not recommended for grounding electrode connections unless specifically permitted as many modern plumbing systems use PVC or other plastic piping underground.</p> <p><i>Change text to read: "A buried metal object or device buried in, or driven into, the ground to which a grounding conductor is electrically and mechanically connected. A buried metal water-piping system can be used if approved and is verified to have at least 3.0m or more in direct contact with the earth and is electrically continuous to the points of connection of the grounding electrode conductor and the bonding conductor(s) or jumper(s), if installed."</i></p>	<p>Make no change. The CEC says that metal water-piping is acceptable. It might be harder to find metal water-piping now, but it is still acceptable.</p> <p>Three meters of contact is a good rule-of-thumb but the important criteria are already listed in the definitions "Grounded" and "Grounding." Something that is Grounded, needs to have a low impedance connection to the mass of the earth. Three meters should provide that, but less might be sufficient and more might be needed.</p>
16	AR	Definitions	<p><u>Grounding Electrode</u></p> <p>The proposed standard uses the language directly out of the CEC but metal water piping systems are generally not recommended for grounding electrode connections unless specifically permitted as many modern plumbing systems use PVC or other plastic piping underground.</p> <p><i>Change text to read: "A buried metal object or device buried in, or driven into, the ground to which a grounding conductor is electrically and mechanically connected. A buried metal water-piping system can be used if approved and is verified to have at least 3.0m or more in direct contact with the earth</i></p>	Make no change. See resolution to #15.

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			<i>and is electrically continuous to the points of connection of the grounding electrode conductor and the bonding conductor(s) or jumper(s), if installed.</i>	
17	RB	Definitions	Qualified Person – This definition needs to be more specific to the entertainment industry and the unique equipment used therein. Insert: “One who has the experience and knowledge of the construction and operation of the equipment as it is used in the entertainment industry.” Any other additional local or national certifications deemed applicable should be specified as well.	Make no change. The definitions in a standard are in relation to the subject matter of the standard.
18	PR	Definitions	Qualified Person – To be consistent with the commonly accepted definition of Qualified Person, there should be an emphasis on training included here. Change to: “One who has the skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved.”	Change to read: “One who has the skills and knowledge related to the construction and operation of the electrical equipment and installations and who is trained to recognize and to avoid the hazards involved.” The commenter's suggested wording requires the person to receive training, but not to actually know what was being taught. We don't really care how the person knows enough to recognize and avoid hazards; we only care that the person can do this.
19	MA	Definitions	<u>Qualified Person</u> The definition in the standard is dated. The entertainment industry is unique and the definition needs to include a mandate for training. <i>Change to: “One who has the skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved.”</i>	See resolution to #18.
20	AR	Definitions	<u>Qualified Person</u> The definition in the standard is dated. The entertainment industry is unique and the definition needs to include a mandate for training. <i>Change to: “One who has the skills and knowledge related</i>	See resolution to #18.

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			<i>to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved."</i>	
21	EK	Definitions	<p>Single pin: (connector or connection) "Single pin: (connector or connection) a single-conductor plug-in locking- type connector. a) A locking, one pin, approved for outdoor use connector, rated up to 400 amperes. Colour coded to designate phasing. (Refer to CEC Section 66); or, b) Broadly refers to an entire method and system of distribution." "A) Many single pin systems, are only used indoors, so being ""approved for outdoor use"" is not needed. B) Some ""Cam-type"" connectors in common use are rated over 400A C) ""Colour coded to designate phasing."" is misspelled. D) ""Colour coded to designate phasing."" and ground + neutral also have color coding requaramints" "Rewrite; a) A locking, one pin, approved for outdoor use connector, rated up to 400 in amperes. Colour Color coded to designate use (phasing, ground or Neutral). (Refer to CEC Section 66); or, "</p>	Make no change. In the context of this standard, this is what we mean by "Single pin."
22	KW	Definitions	Tails-suggest that the word <i>dropdown</i> be added after Supply Tails, and <i>tie in</i> be added after Load tails to clarify what is being discussed. Those are the terms most often used, and will be recognizable to the worker.	Make no change. "Supply tails dropdown" and "Load tails tie in" do not add clarity.
23	RB	Definitions	Tails...is backwards. It describes Supply for Load and Load for Supply. Reassign definitions properly.	Make no change. It seems that either term can be used, depending on whether one is looking at the tails from the source end or the load end. The tails are tails either way.
24	RB	Definitions	Volt – The FPN is voltage not volt. Delete	Move it to below "Voltage."
25	MA	Definitions	<u>Volt</u>	Move it to below "Voltage."

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			The FPN describes voltage, not a volt. <i>Strike or move to after Voltage.</i> The definition is repeated.	
26	AR	Definitions	<u>Volt</u> The FPN describes voltage, not a volt. <i>Strike or move to after Voltage.</i> The definition is repeated.	See resolution to #26.
27	JE	General	I'm curious that there is no mention of anyone having to be <i>competent</i> to do electrical work, only <i>qualified</i> . Certainly over here in the UK there is a general requirement for competence, of which qualifications may be a part. This is an observation for discussion as deemed appropriate.	Make no change. None suggested.
28	KW	General	I have one question for the Electrical Power Working Group, who is asking for this document other than this group? Some comments and revisions follow:	Make no change. None suggested. Letters were supplied at the March 2016 EPWG meeting from non-EPWG members who are materially affected parties and who feel this document would be useful.
29	LH	General	It is inappropriate for one group of people to write a standard that affects another group. Please abandon this project. We should be able to write our on standards with out any conflict from other groups.	Make no change. ESTA's TSP is not an "other group." It's participants are from many nations, including Canada; public review and comment is open to all who are materially affected.
30	EK	Scope	Scope 2nd Paragraph ... inlet of the last disconnecting means or utilization equipment. This removes the internal bussing between the input and output(feed-thru) connectors "Change; 1.1 Electrical equipment used in all installations shall be approved and... TO 1.1 Electrical equipment used in all installations shall be Listed and labeled to ANSI UL 1640 and..."	Make no change. UL 1640 clause 1.1 says: "These requirements cover portable power-distribution equipment intended to distribute power in accordance with the National Electrical Code, NFPA 70 (NEC)." E1.51 is for use with the Canadian Electrical Code; UL 1640 is not relevant.
31	EK	Scope	Scope (i) (i) concerts Repetitive (g) includes Concerts Eradicate (i)	Make no change. Concerts are live events, but the repetition does no harm and eliminates arguments about serious music events being somehow different

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				from other entertainments.
32	EK	Scope	Scope (h) (h) touring shows and productions; Repetitive (g) includes touring shows and productions Eliminate (h)	Make no change. The repetition does no harm.
33	EK	Scope	Scope (f) (f) remote broadcasting and recording locations; Redundant See (e) Above it Remove (f)	Make no change. The repetition does no harm.
34	MA	1.2	<u>Section 1.2 - cable repair</u> Enforcement of this section of the standard would make field and shop repair of cable and connectors impossible, placing an undue burden on production and rental facilities. Custom cable lengths for cord sets would not be possible. <i>Insert: "1.4 Cordset repair. Qualified persons shall be allowed to repair cordsets using listed parts."</i> The term "approval" is used incorrectly. A testing agency will "list" an item for use but only an AHJ can "approve" the use of the item. <i>Change "approval" with "listing."</i>	Make no change. Field repairs are common practice, but adding a one-sentence clause to cover equipment maintenance brings into this standard a topic that needs many more words. The use of the word "approved" covers all reasonable repairs. "Approved" is an appropriate term of art. For an example, see 29 CFR 1910.305(g)(1)(i), which says, "Flexible cords and cables shall be approved for conditions of use and location."
35	AR	1.2	<u>Section 1.2 - cable repair</u> Enforcement of this section of the standard would make field and shop repair of cable and connectors impossible, placing an undue burden on production and rental facilities. Custom cable lengths for cord sets would not be possible. <i>Insert: "1.4 Cordset repair. Qualified persons shall be allowed to repair cordsets using listed parts."</i> The term "approval" is used incorrectly. A testing agency will "list" an item for use but only an AHJ can "approve" the use of the item. <i>Change "approval" with "listing."</i>	See resolution to #34.
36	PR	1.2	Section 1.2. This section seems to require that all cordsets in inventory must have been purchased directly from manufactures. The fact is EVERY rental company (and end user like WGBH) sometimes needs to build a cordset with listed parts to a specific length, or to replace a section of	See resolution to #34. WGBH is in Boston. MA. It is outside the geographic scope of E1.51.

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			<p>damaged cable. An example would be when a 50' feeder cable is shortened to a 25' cordset by cutting o the damaged part of the cable and installing a new, listed connector.</p> <p>Insert: "1.4 Cordset repair. Qualified persons shall be allowed to repair cordsets using listed parts."</p>	
37	RB	1.2	<p>Section 1.2: There needs to be an allowance for repair of cable in the field.</p> <p>Also, the proper term is "listed", not "approve." Replace "approve" with "listed."</p>	See resolution to #34.
38	KW	1.3	<p>1.3-it should end with CEC rather than CE Code as that is not the common way to mention the Code, it is most often referred to as the CEC; the Code; or the Canadian Electrical Code; rarely does one say the CE Code.</p> <p>-this should be done in all parts of the document that uses this language.</p>	Change to "Canadian Electrical Code."
39	MA	1.3	<p><u>Section 1.3</u> <i>Replace "approved" with "listed" to be consistent with Section 1.2.</i></p>	Make no change. "Approved" is an appropriate term of art. For example, see the CFR clause cited in the resolution #34.
40	AR	1.3	<p><u>Section 1.3</u> <i>Replace "approved" with "listed" to be consistent with Section 1.2.</i></p>	Make no change. See resolution to #39.
41	PR	1.3	Section 1.3 – Replace "approved" with "listed" to be consistent with Section 1.2.	Make no change. See resolution to #39.
42	RB	1.3	Section 1.3 – Proper term is "listed." Replace "approve" with "listed."	Make no change. See resolution to #39.
43	KW	2.2.3	<p>2.2.3-CEC 66-400(3)(c)(i) does not state what the writers say it does. It actually states:</p> <p><i>"(i) have connectors and receptacles that are rated in amperes and designed so that differently rated devices cannot be connected to each other"</i></p>	Strike the Code reference.

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			<p>I would suggest that this language be struck from the document, or more suitable language, without this code reference be used. Yes, it is common practice to use the same single pin connector on all ranges of cable from #4 to 4/0, but this is not the correct place to reference. That might be found in Part 2 of the code, or from the manufacturer, but not here.</p> <p>Also, cords commonly refers to cord sets like 12/3 cable and rarely to single pole connection systems.</p>	
44	JE	2.2.5	<p>Section 2.2.5 - the operating temperature of the connectors should be coordinate with that of the cable - both are stated as minimums, whereas I could use a cable rated at 180 degrees at it's working temp with a connector only rated at 90 degrees. Reword to the effect of 'Connectors should have a temperature rating not less than the maximum working temperature of the cable'.</p>	<p>Make no change. Requiring them to be have the same rating would gain nothing. The connectors and cable simply need to have ratings suitable for the environment and use. One could be rated higher than the other; there is no hazard in this.</p>
45	MA	2.2.6	<p><u>Section 2.2.6 - Termination</u></p> <p>This statement is an opinion and may conflict with manufacturer's guidelines nor can the standard envision every future connector. The standard enters dangerous territory advising people to disregard a manufacturer's instructions. This is not a training document so the opinion is inappropriate.</p> <p><i>Change language to "Single-pole connectors shall be terminated to single-conductor cable as per the manufacturer's instructions."</i></p>	<p>Make no change. We addressed this in resolving second public review comment 43. Extensive field experience has shown that single-setscrew connectors do not work well in the field and should be avoided, if possible.</p>
46	AR	2.2.6	<p><u>Section 2.2.6 - Termination</u></p> <p>This statement is an opinion and may conflict with manufacturer's guidelines nor can the standard envision every future connector. The standard enters dangerous territory advising people to disregard a manufacturer's instructions. This is not a training document so the opinion is inappropriate.</p> <p><i>Change language to "Single-pole connectors shall be terminated to single-conductor cable as per the</i></p>	<p>Make no change. See the resolution for comment 45.</p>

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			<i>manufacturer's instructions.</i> "	
47	RB	2.2.6	Section 2.2.6 Termination – This may conflict with manufacturer's guidelines and should be amended not to do so. Change language to read: "Connectors shall be installed under the recommended guidelines of the manufacturer.	Make no change. See the resolution for comment 45.
48	KW	3.5	<p>3.5-this section, as I have stated in all my public review comments needs to be struck from the document.</p> <p>In the last comment resolutions, the reply statement made was</p> <p><i>"the AHJ always has the last say. Each situation is evaluated by the AHJ on a case by case basis."</i></p> <p>To me this remark is ridiculous, and disrespectful of the worker. In the document, they tell the worker to do something that is not permitted in the Code, and then state that the AHJ shall decide. Well, which is it? Do we do the work and get reprimanded, or worse, by the AHJ, or do we acknowledge this is always done and allow the worker and the AHJ to decide what is acceptable <i>"mechanical protection"</i>?</p> <p>I cannot deny that this is done constantly on film and television sets, but the methods used have been formulated over years of discussions and compromise on both sides to reach a workable situation for both parties. To put such flimsy language does a disservice to all parties and also, to me, puts ESTA and ANSI in an even more precarious position as they have allowed language that runs counter to the CEC.</p> <p>This is one of those slippery slope pieces of language that will create nothing but strife, as the AHJ could just state "follow the code", and then the worker has no options available to distribute cable into, or out of, a structure. Leave this to each AHJ on that <i>"case by case basis"</i>.</p> <p>How about the following language:</p> <p><i>"As feeder cables shall not penetrate walls; floors;</i></p>	<p>Make no change.</p> <p>The Authority Having Jurisdiction is by definition the authority having jurisdiction.</p> <p>American National Standards are voluntary compliance documents, unless they are adopted into regulations verbatim or by reference. The AHJ therefore is not required to follow this standard, unless it is adopted into local regulations. However, this standard gives the AHJ a reasonable basis for allowing what you describe as common practice. Without this E1.51 document, there is nothing in writing to support an AHJ's decision to allow a practice that runs counter to the Code. Without E1.51, the safest thing for an AHJ to do would be to say, "Follow the Code."</p> <p>The "years of discussion and compromise" you mention do not exist for an AHJ or worker new to the profession. They are at a disadvantage if there is nothing written suggesting that practices formulated by veterans over years of discussion and compromise can be used safely.</p>

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			<i>windows; ceilings; or doors; contacting the AHJ to see what is an acceptable method should be part of the design phase of any power distribution system.”</i>	
49	KW	4.2 / 4.3	<p>4.2/4.3-Should be combined as “Feeder cable connectors:” as it discusses more than wrong connections. The section covers the type of connector to be used; wrong connections and colour coding, and therefore should be renamed as suggested.</p> <p>I would suggest that sections 4.2 and 4.3 be combined, as well the incorrect section of the CEC was quoted for 4.2; it is actually 66-400(4) that was quoted.</p> <p><i>“4.2 Feeder Cable Connectors</i></p> <p><i>1) Plug-in connectors for single-conductor cables shall</i></p> <p><i>a) be of a locking type; and</i></p> <p><i>b) incorporate a mechanical interlock to prevent wrong connections or be colour-coded.</i></p> <p><i>2) For single-conductor cables, the grounded conductor and the bonding conductor shall be permitted to have the female half connected to the supply end of the cord. (66-400(4)).</i></p>	Make no change. The comments are not relevant to the public review document, EP/2012-7009r7. The cited clauses are not as quoted here.
50	MA	4.3	<p><u>Section 4.3 - Wrong connection prevention</u></p> <p>This section should be color-coding. Connections shall only be made by qualified persons, eliminating the need for the standard to have a section on “preventing wrong connections.”</p> <p><i>Change the title to “Connections” and clause (b) to read “be colour-coded or incorporate a mechanical interlock.”</i></p>	<p>Make no change. Steps still need to be taken to prevent wrong connections, even if qualified persons are the only ones permitted to make connections. Qualified persons have been known to make mistakes.</p> <p>It is felt that locking connectors, besides being more reliable than simple pin-in-sleeve slip connectors, require more attention from the worker to make the connection. This attention is important if no mechanical interlock is used.</p>
51	AR	4.3	<p><u>Section 4.3 - Wrong connection prevention</u></p> <p>This section should be color-coding. Connections shall only</p>	Make no change. See the resolution to comment 50.

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			<p>be made by qualified persons, eliminating the need for the standard to have a section on “preventing wrong connections.”</p> <p><i>Change the title to “Connections” and clause (b) to read “be colour-coded or incorporate a mechanical interlock.”</i></p>	
52	PR	4.3	<p>Section 4.3 The emphasis of this section should be colour-coding. When connections are made by qualified persons, the need for idiot-proof requirements is eliminated.</p> <p>Change the title to “Connections” and clause (b) to read “be colour-coded or incorporate a mechanical interlock.”</p>	Make no change. See the resolution to #50.
53	KW	4.4	<p>4.4-this section discusses the temperature of a cable assembly, not the ampacity of it. Are we discussing temperature, or ampacity? I realize that heat will cause issues for ampacity, but what is the end game for this language. It is also verbose, and rather incoherent. Suggest the rewrite below:</p> <p><i>“The cable system shall be limited to the ampacity of the cable in use, and have an overcurrent device in place that will protect the cable, and connectors, from reaching an ampacity, beyond the cable systems rating.</i></p> <p><i>It should be noted that temperature has an impact on the ampacity, and should be considered when designing the system so as to not place a strain on the cable and connectors.”</i></p> <p>Or, one could make 2 separate sections of this topic as it is something that is woefully ignored throughout the document.</p>	<p>Change 4.4 to read:</p> <p>“The maximum current of a cable assembly (ampacity) shall be limited by an overcurrent protection device to a value that will prevent the cable or connector from reaching a temperature higher than its temperature rating. The overcurrent protection device shall be on the supply side of the cable assembly.”</p> <p>Subsequent clauses deal with high ambient temperatures and derating because of cable bundling.</p>
54	KW	4.4.1	<p>4.4.1(1)-strike this language and just use the language form CEC section 66-454 in it’s entirety. (a) is not of importance to the worker as cable installed in this way is done under separate sections of the Code and confusing for a worker just laying out a feeder system on the ground, or in the air; (b) is part of the section I suggest copy/pasting; and (c) should be added to a new section on how to deal with</p>	<p>Make no change. No error in the current language is cited, and the commenter has previously objected to including too much of the CEC verbatim.</p> <p>Clause (a) may not matter to a worker laying out cable on the ground or in the air, but it will matter if the worker has to run it through more than a meter of cable ramp or other protective enclosure.</p>

#	Cmmntr	Clause	Comment or reason	Proposed resolution
			ambient temperature of the system in general.	
55	MA	4.4.1	<p><u>Section 4.4.1 - Conductor Ampacity</u></p> <p>The derating values are far too extreme in comparison to actual practice. We have a bit of apple vs. oranges due to the fact the proposed standard references conductors in a conduit, nipple or enclosure for less than 1 meter which limits the ability to dissipate the heat and would decrease the ampacity. Just noting, not looking to muddy the waters with a larger group.</p> <p><i>Reference table 520.44 directly for the ampacity of an entertainment electrical system</i></p> <p><i>that typically has a load diversity factor minimum of 50%.</i></p>	<p>Make no change. Clause 4.4.1 (1) (a) is relevant in many situations, including those where cable ramps are used.</p> <p>Table 520.44 is inappropriate because it does not include the large gauge wire sizes used for many portable power feeder cable applications, and because it is from NFPA 70, a US document. This document is based on the CEC and appropriately references tables there.</p>
56	AR	4.4.1	<p><u>Section 4.4.1 - Conductor Ampacity</u></p> <p>The derating values are far too extreme in comparison to actual practice. We have a bit of apple vs. oranges due to the fact the proposed standard references conductors in a conduit, nipple or enclosure for less than 1 meter which limits the ability to dissipate the heat and would decrease the ampacity. Just noting, not looking to muddy the waters with a larger group.</p> <p><i>Reference table 520.44 directly for the ampacity of an entertainment electrical system</i></p> <p><i>that typically has a load diversity factor minimum of 50%.</i></p>	Make no change. See the resolution to comment 55.
57	PR	4.4.1	<p>Section 4.4.1 These derating values are far too extreme in comparison to actual practice in Entertainment. Recall that we are dealing with dynamic loads that are constantly monitored by qualified personnel.</p> <p>Strike the section or use the guidelines of Articles 520 and 530 of the NEC since those articles are specific to the our industry.</p>	<p>Make no change.</p> <p>This document is intended to be aligned with the Canadian Electrical Code. The recommendations of the NEC are not relevant.</p>
58	RB	4.4.1	<p>Section 4.4.1 Conductor Ampacity – These de-rating values are incorrect and onerous compared to reality. Better to use the guidelines of NEC 520/530.</p>	<p>Make no change.</p> <p>This document is aligned with the Canadian Electrical Code. The recommendations of the NEC are not</p>

#	Cmmntr	Clause	Comment or reason	Proposed resolution
				relevant.
59	KW	4.4.2	4.4.2-1 would suggest this be fleshed out to deal with more than ambient temperatures, but also the temperatures caused by ampacity, and its affect on cable and connectors. I am unsure of that language, sorry.	Make no change. The clause is to address elevated ambient temperatures. It does that.
60	KW	4.6	4.6 Frequency-should be deleted from the document and all other sections renamed accordingly. This is mention later in section 6.4.2, and it is confusing to me when placed in this area of the document as it comes out of nowhere that has been discussed in section 4 of the document. It makes more sense when read in the 6.4.2 portion of the document.	Make no change. Different frequencies in a system can cause technical problems if unintentionally intermixed. Having two clauses to help avoid this problem might be redundant, but does no harm. This is a problem to avoid, and 60 Hz is so common that the possibility of other frequencies might be overlooked.
61	RB	5.1	Section 5.1 Main Disconnect - Appears to disallow the use of tails in any main disconnect. This seems onerous and not always realistic when dealing with lugs in a main. Insert: "Lugged connections shall be allowed if approved by the local AHJ."	Make no change. We would prefer that lugged connections not be used.
62	MA	6.1	<u>Section 6.1 - Cable routing</u> Practical experience shows that the cable routing is an intrinsic part of the system design. You can't design the system without planning the cable route. This section would be better to identify possible hazards. <i>Change to "Prior to installation the cable route shall be evaluated so as not to interfere with means of egress or fire protection systems and for hazards to cable and personnel such as sharp edges, doors, and pedestrian and vehicle paths."</i>	Add the suggested sentence to the existing sentence, and add references to existing clause 7.1.5 and subclauses. The commenter states that "You can't design the system without planning the cable route," but the suggested clause that is to be substituted does not mention "planning." However, it is important to identify potential hazzards, which the existing clause does not require. (Adding "means of egress and fire protection systems" would be a substantive change, triggering a sixth public review.)
63	AR	6.1	<u>Section 6.1 - Cable routing</u> Practical experience shows that the cable routing is an intrinsic part of the system design. You can't design the system without planning the cable route. This section would be better to identify possible hazards. <i>Change to "Prior to installation the cable route shall be evaluated so as not to interfere with means of egress or fire</i>	See the resolution to #62.

#	Cmmntr	Clause	Comment or reason	Proposed resolution
			<i>protection systems and for hazards to cable and personnel such as sharp edges, doors, and pedestrian and vehicle paths."</i>	
64	RB	6.1	Section 6.1 Cable routing - Seeking a concrete cable plan prior to installation while desirable, is not always practical. Certain active productions, such as film or tv shoots can be constantly changing or may not know their routing until the moment they get on location. What type of event and where it is should dictate the need for more specific plans ahead of time, like in a convention or trade show. Change language to read: "Prior to laying out cable, ensure the route is free of hazards to pedestrians and the cable and does not interfere with fire safety systems or means of egress."	See the resolution to #62. Planning does not have to be "concrete." One simply needs to think ahead.
65	KW	6.2.2	6.2.2-this section should be struck from the document, as I have stated many times in the past, this is not the intent section of the CEC, 14-100, which is being bastardized for this language. As stated in the past, this is an "and" section, not an "or" section, so whatever is done has to be considered in relation to all parts of the language. 14-100 has many parts that would disallow this kind of work, and as such we need to ensure that the worker is not seeing that this application is allowed when it is not wholly acceptable to the Code.	Make no change. The committee disagrees with you about the intent of CEC 14-100. The clause here requires over-current protection if the smaller cable is 3 meters or longer. The CEC requires that too. The CEC also requires over-current protection if other conditions are not met. E1.51 does not negate those other requirements.
66	RB	6.2.2	Section 6.2.2 Tap Points - The "3 meter" length requirement should be 10', otherwise it is 2" short of the most utilized short feeder jump used in the entertainment industry, the 10' camlok rack jumper. This places many shops and electricians officially/legally out of compliance over 2" of cable. While this may not seem like an issue, if there is a failure and this 2" discrepancy is used as an excuse to prosecute or direct blame toward non-compliance, it would be correct then to do so, but terribly inaccurate and inconsequential. Needs to be fixed. Change to 10'.	Make no change. The distance specified in CEC 14-100 is 3 meters, not 10'.
67	KW	6.4.1	6.4.1-title should be "Voltages over 150v to ground", as that is what it truly discusses, and as such better represents what follows. I would also suggest just using the language from CEC 66-456 (5) and (6). This will make it a bit easier	Change clause title to 'Voltages over 150 V to ground.' Make no other changes. The commenter has previously objected to too much

#	Cmmntr	Clause	Comment or reason	Proposed resolution
			to read, and understand. As how to colour code is not mentioned in this section of the CEC, you could balance out 6.4.1 with the language in the present (e). Though there is rarely a neutral involved in these systems, a defined colour is not a bad idea.	CEC language, so adding more is not helpful, particularly when the CEC language is incomplete, as the commenter notes.
68	MA	6.4.1	<p><u>Section 6.4.1 - Inline enclosures</u></p> <p>Inline connections are accomplished through insulated locking connectors that make this requirement unnecessary. This equipment is used in a controlled environment by qualified personnel also making this a moot point. When used in areas accessible to the general public or these connections can be protected in another manner such as barricading.</p> <p><i>Strike the section</i></p>	<p>Stiking the section does not seem reasonable if barricading might be needed. Change to read: . . .</p> <p><u>“have all inline connectors made inaccessible to the general public by enclosing the joint or connector(s) in a secured, non-conductive box or enclosure, or by being protected by a barricade;</u></p>
69	AR	6.4.1	<p><u>Section 6.4.1 - Inline enclosures</u></p> <p>Inline connections are accomplished through insulated locking connectors that make this requirement unnecessary. This equipment is used in a controlled environment by qualified personnel also making this a moot point. When used in areas accessible to the general public or these connections can be protected in another manner such as barricading.</p> <p><i>Strike the section</i></p>	See the resolution to #68.
70	PR	6.4.1	<p>Section 6.4.1 This requirement is not needed in Entertainment. The locking connectors are used in areas inaccessible to the general public, in a controlled environment, and monitored by qualified personnel. When used in areas that MAY be accessible to the general public, these connections can be protected in another manner such as barricading.</p>	See the resolution to #68.
71	RB	6.4.1	<p>Section 6.4.1 Inline enclosures – Completely unnecessary and overly burdensome in the entertainment field. Our connections inline are already made with insulated</p>	<p>The connectors generally used are not tamper-resistant; it is commonly felt that the connectors should not be accessible to the general public. See the</p>

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			connectors. Delete.	resolution to #68.
72	RB	6.4.2.1	Section 6.4.2.1 AC Frequencies - Makes little sense based on practical use to mark ALL cables with their respective hz. "all branches of the system" should not need to have frequency shown. What is run as standard 60hz, should not require this, but ALL exceptions to 60hz should ALL be marked. Change to read that all "non-60hz" branches must be marked as such.	Make no change. Redundant marking is helpful for clarity. Mixing frequencies can cause serious problems and confusion.
73	KW	6.4.3	6.4.3-language is confusing. Suggest the following rewrite: <i>"The total load used on a portable power system shall not exceed 80% of the rating of the overcurrent device unless the device is specifically marked as a 100% rated device".</i> I suggest this as there are many times systems are built so that if it all was used at once the overcurrent device would fail, but when under the supervision of a qualified person, there is the ability to have a larger potential than will be used at any one time; much like our homes.	Make no change. The existing language is in reference to the over-current protection on the conductors. The suggested wording is more clear, but it references an over-current device for the system.
74	KW	6.5	6.5-Strike this section as it is overreaching and will not only cause undue stress to the worker, it will create a huge cost to the production for what is a perceived issue that may, or may not actually exist. CEC 2-304(1) is used to support this statement, but the section does allow for "live work" <i>"(1) No repairs or alterations shall be carried out on any live equipment except where complete disconnection of the equipment is not feasible."</i> Based on this language, one could just as easily argue that you can work live as well, should one not be able to have "complete disconnection". As an example, I use one of my four stages on my present production. Our stages are 250'x100' and we have 5#2 banded spread throughout via 12 different systems, each protected by 200A switched disconnect. As we have open	Change "shall" to "should." As you write, "working live is never a great plan," but perhaps nothing will need to be added, so "working life" will never happen and having the spare disconnects would be a waste of money. If additions need to be made, then plans can be made as to how this can be done safely. NFPA 70E often requires risk assessment, rather than following a rigid set of rules, to figure out how to do something with acceptably low risk to the worker. What's the minimum that needs to be done to be reasonably safe?

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			<p>points to add equipment throughout, this section tells me I would need to factor in as many as 40 disconnection means to meet the criteria written.</p> <p>As there only 200A and 100A switched disconnects available for me to rent, this language is adding a possible \$2400/week to my budget, per stage, for a possible increase in costs of \$48,000 per stage, \$100,000 for my 4 stages, for my employers to cover over our 5 month production schedule for something that is a perceived issue. Rental rates are based on my extremely good pricing, that is about one half of the rates in most areas of the country.</p> <p>Do you want to tell my employer why this is now a requirement when the Code does allow for a "certified worker" like myself to do this work live? I will gladly send them to ESTA and ANSI on this one, as I have no reasoned answer for this rule.</p> <p>While working live is never a great plan, having these devices in place is totally unnecessary as one can add to a cam loc system safely while energized by simply ensuring the down stream devices one is adding are simply turned off, no? There are methods to do this safely without the undue financial burden to our employers that this language presents.</p> <p>We do not expect the worker to turn off breakers when adding an Edison cable; joy cable; or Bates connectors; so why this language?</p>	
75	MA	6.5	<p><u>Section 6.5 - Spare disconnects</u></p> <p>Mandatory equipment requirements will impose unnecessary expense to production. Production and the Qualified Person will evaluate the best and safest way to modify the system. This standard is not a design manual.</p> <p><i>Strike this section.</i></p>	See the resolution to 74.
76	AR	6.5	<p><u>Section 6.5 - Spare disconnects</u></p> <p>Mandatory equipment requirements will impose</p>	See the resolution to 74.

#	Cmmntr	Clause	Comment or reason	Proposed resolution
			unnecessary expense to production. Production and the Qualified Person will evaluate the best and safest way to modify the system. This standard is not a design manual. <i>Strike this section.</i>	
77	PR	6.5	Section 6.5 While planning for expansion is a nice idea, this should not be part of a national standard. This is better suited to a "Best Practices" document. Qualified Person will evaluate the best and safest way to expand the system, if needed.	See the resolution to 74.
78	RB	6.5	Section 6.5 Spare disconnects - Let the production determine spare needs, even though this is a good practice, it should not be required. Delete.	See the resolution to 74.
79	MA	7.1.3	<u>Section 7.1.3 - Number of interconnections</u> This is a vague requirement and provides no guidance. This standard is not a design manual. <i>Strike this section.</i>	Make no change. "Kept to a minimum" is specific enough. Although the word "design" does not appear in the title, guidance on the selection, installation, and use of single-conductor portable power feeder cable involves guidance on design, as the commenter recognizes in his comment on clause 6.1, listed here as comment 62.
80	AR	7.1.3	<u>Section 7.1.3 - Number of interconnections</u> This is a vague requirement and provides no guidance. This standard is not a design manual. <i>Strike this section.</i>	See the resolution to 79. AR's comment on "design" in reference to clause 6.1 is listed here as comment 63.
81	PR	7.1.3	Section 7.1.3 Again, this should not be part of a national standard. This is better suited to a "Best Practices" document. Qualified Person will evaluate the best and safest way to design the system.	Make no change. No argument is made for the desirability of an unconsidered multiplicity of connections.
82	RB	7.1.3	Section 7.1.3 Number of interconnections - Pointless...cut it. Delete.	See the resolution for #81.
83	MA	7.1.4	<u>Section 7.1.4 - Excess length</u> Practical experience demonstrates that qualified personnel	Make no change. The commenters notes that what is recommended is good work practice. The qualified person is not harmed by having a recommendation for

#	Cmmntr	Clause	Comment or reason	Proposed resolution
			<p>will do everything they can to avoid lifting/moving excess cable. They don't need to be told to avoid doing extra unnecessary work. The qualified person will plan and use the correct lengths of cable as necessary.</p> <p><i>Strike this section.</i></p>	good practice be published for the benefit of those who may not be expert.
84	AR	7.1.4	<p><u>Section 7.1.4 - Excess length</u></p> <p>Practical experience demonstrates that qualified personnel will do everything they can to avoid lifting/moving excess cable. They don't need to be told to avoid doing extra unnecessary work. The qualified person will plan and use the correct lengths of cable as necessary.</p> <p><i>Strike this section.</i></p>	See the resolution for #83.
85	PR	7.1.4	<p>Section 7.1.4 Again, this should not be part of a national standard. This is better suited to a "Best Practices" document.</p> <p>Qualified Person will determine the most eicient system design.</p>	See the resolution for #83.
86	RB	7.1.4	<p>Section 7.1.4 Excess length - Silly....Delete.</p>	See the resolution for #83.
87	MA	7.1.5.1	<p><u>Section 7.1.5.1 (cable mats)</u></p> <p>The term "cable mats" refers to a specific device and other devices can be used.</p> <p><i>Change "cable mats" to "devices." An Informational Note can be added to include a statement that some locations may require the protective devices to be compliant with regulations concerning handicap access.</i></p>	Make no change. "Cable devices" is less meaningful in this context than "cable mats."
88	AR	7.1.5.1	<p><u>Section 7.1.5.1 (cable mats)</u></p> <p>The term "cable mats" refers to a specific device and other devices can be used.</p> <p><i>Change "cable mats" to "devices." An Informational Note can be added to include a statement that some locations may require the protective devices to be compliant with</i></p>	See the resolution to #87.

#	Cmmntr	Clause	Comment or reason	Proposed resolution
			<i>regulations concerning handicap access.</i>	
89	RB	7.1.5.1	Section 7.1.5.1 (cable mats) – Cable mats is too specific a term. Come up with something else.	Make no change. “Come up with something else,” is unresolvable. It offers no suggestion as to what would remove the objection that “mats” is too specific.
90	KW	7.1.5.2.1	<p>7.1.5.2.1-no cable protection system should be of made of conductive materials, and there should be no suggestion of doing so as it sets a dangerous precedent.</p> <p>As for the weight ratings, how do you propose to have protection systems that are not from a manufacturer to be weight rated? Any system made of wood is safe for most weights, but do you expect them to be tested by a certification body? That is a costly endeavour, and to what end?</p>	<p>Make no change; none suggested.</p> <p>Conduit is a cable protection system made of conductive material. Banning all conductive material does not seem reasonable.</p> <p>Something being made of wood does not guarantee that it will support all loads.</p> <p>Rating would not require testing, but would require the manufacturer to say something about what the protection system is intended to be able to support.</p>
91	MA	7.1.5.2.1	<p><u>Section 7.1.5.2.1 (weight rated cable mats)</u></p> <p>The term “cable mats” is confusing because cable mats typically are not designed to prevent crushing. The term “rated” eliminates the use of custom made crossovers. Practical experience demonstrates that in studio environments many pre-made crossovers cannot be used and must be custom built. This would require an engineer to rate/design the crossover and adds an unnecessary expense to production.</p> <p><i>Change the section to read: “Cable shall not be subjected to vehicular traffic. When vehicular traffic must cross over cables, devices manufactured for the purpose of protecting the cable and constructed to accommodate the weight of expected vehicles shall be used to protect the cable.”</i></p>	Accept new language: “Cable shall not be subjected to vehicular traffic. When vehicular traffic must cross over cables, devices manufactured for the purpose of protecting the cable and constructed to accommodate the weight of expected vehicles shall be used to protect the cable.”
92	AR	7.1.5.2.1	<p><u>Section 7.1.5.2.1 (weight rated cable mats)</u></p> <p>The term “cable mats” is confusing because cable mats typically are not designed to prevent crushing. The term “rated” eliminates the use of custom made crossovers. Practical experience demonstrates that in studio environments many pre-made crossovers cannot be used</p>	See the resolution to #91.

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			<p>and must be custom built. This would require an engineer to rate/design the crossover and adds an unnecessary expense to production.</p> <p><i>Change the section to read: "Cable shall not be subjected to vehicular traffic. When vehicular traffic must cross over cables, devices manufactured for the purpose of protecting the cable and constructed to accommodate the weight of expected vehicles shall be used to protect the cable."</i></p>	
93	PR	7.1.5.2.1	<p>Section 7.1.5.2.1 Cable mats are NEVER used for vehicular traic. Without using the term "Yellow Jacket", this method of protecting crushing of cables could be described as "interlocking, modular crushproof raceways" Change the section to read: "Cable shall not be subjected to vehicular traic. When vehicular traic must cross over cables, raceways manufactured for the purpose of protecting the cable and constructed to accommodate the weight of expected vehicles shall be used to protect the cable."</p>	See the resolution to #91.
94	RB	7.1.5.2.1	<p>Section 7.1.5.2.1 (weight rated cable mats) – "weight rated" cable mats are not always practical or the right solution. 2x4 wood is not "weight rated" per se, but can function to protect cable in this situation. Change the spec to reflect what the problem is that is being addressed rather than spec a generic and perhaps inapplicable solution.</p>	See the resolution to #91.
95	KW	7.1.5.2.2	<p>7.1.5.2.2-Strike this section as per above comments. [See Comment]</p>	Make no change. Cable protection could include metallic conduit.
96	KW	7.1.5.2.3	<p>7.1.5.2.3-Strike this language as it is onerous and totally unnecessary as one should not put out cable protection if it cannot support the weight of vehicles crossing it. Also, what happens when a vehicle that might be an issue arrives, tell it to leave?</p>	<p>Make no change. Resolution to 91 has the cable protection being designed to support the weight of "expected vehicles." Therefore, some judgement must be made as to what vehicles are expected. Whatever judgement that is can be posted.</p> <p>If something heavier comes along, telling it to leave is one option. Strengthening the cable protection is another. Removing the cables is a third. Letting the vehicle crush the cable protection and the cables is not</p>

#	Cmmntr	Clause	Comment or reason	Proposed resolution
				a viable option.
97	MA	7.1.5.2.3	<p><u>Section 7.1.5.2.3 (signage)</u></p> <p>Practical experience demonstrates that this is not a feasible option in studio environments where many pre-made crossovers cannot be used and must be custom built. This would require an engineer to rate/design the crossover and adds an unnecessary expense to production. In all cases production would be saddled with the unnecessary expense of creating/renting, installing, and handling these signs.</p> <p><i>Strike this section.</i></p>	Make no change. The sign could be made with cardboard and a marker. That would not be onerous.
98	AR	7.1.5.2.3	<p><u>Section 7.1.5.2.3 (signage)</u></p> <p>Practical experience demonstrates that this is not a feasible option in studio environments where many pre-made crossovers cannot be used and must be custom built. This would require an engineer to rate/design the crossover and adds an unnecessary expense to production. In all cases production would be saddled with the unnecessary expense of creating/renting, installing, and handling these signs.</p> <p><i>Strike this section.</i></p>	See the resolutions to 96 and 97.
99	PR	7.1.5.2.3	<p>Section 7.1.5.2.3 Again, this should not be part of a national standard. This is better suited to a "Best Practices" document. Standard vehicular traic will likely never exceed the capacity of "interlocking, modular crushproof raceways".</p>	See the resolutions to 96 and 97.
100	RB	7.1.5.2.3	<p>Section 7.1.5.2.3 (signage) - Delete this...waste of time and resources.</p>	See the resolutions to 96 and 97.
101	KW	7.2.2	<p>7.2.2-The informative note is of no merit in a standard as it is subjective and unneeded, and should be removed.</p> <p>Now if this were a training document it could be or use with some new wording.</p>	Make no change. The note about "if this were a training document" indicates that the note is not factually incorrect and is useful. The commenter doesn't like it, but no standard is written to please everyone.
102	MA	7.2.2	<p><u>Section 7.2.2 Informational Note</u></p> <p>This document is a proposed standard not a training</p>	Make no change. No argument is made that the note detracts from the document. See the resolution to 101.

#	Cmmntr	Clause	Comment or reason	Proposed resolution
			document. The informational note adds nothing to the standard. <i>Strike the informational note.</i>	
103	AR	7.2.2	<u>Section 7.2.2 Informational Note</u> This document is a proposed standard not a training document. The informational note adds nothing to the standard. <i>Strike the informational note.</i>	Make no change. No argument is made that the note detracts from the document. See the resolution to 101.
104	PR	7.2.2	Section 7.2.2 When predicting the behavior of electricity, I don't know an electrician who differentiates rural areas with urban areas. Strike this note.	Make no change. There is no argument here about how or why this note is incorrect. The only argument is about what electricians the commenters know do. Electrical systems in rural areas often are different from those in urban areas. They often are at a higher or lower nominal voltage, may be only single-phase, and so on.
105	RB	7.2.2	Section 7.2.2 Informational Note – Pointless....Delete.	See the resolution to #101.
106	MA	7.2.5	<u>Section 7.2.5 - Fault current limiting</u> There is no real basis for this request as each “portable” installation is different and due to the fact that the majority of entertainment installations are resistive (lighting) and the length of cable involved, this limits the fault current considerably. <i>Strike this section.</i>	Make no change. The types of loads is irrelevant. The issue here is that high fault current, not load current, can cause the cables to move. The clause is a straight quote from CEC 66-452, the chapter dealing with “Amusement parks, midways, carnivals, film and TV sets, TV remote broadcasting locations, and travelling shows.” We could not state this here, but you would still have to do it. The difference would be that you would have to find the requirement in the 738-page CSA 22.1, rather than an E1 document of far fewer pages.
107	AR	7.2.5	<u>Section 7.2.5 - Fault current limiting</u> There is no real basis for this request as each “portable” installation is different and due to the fact that the majority of entertainment installations are resistive (lighting) and the length of cable involved, this limits the fault current	See the resolution to 106.

#	Cmmntr	Clause	Comment or reason	Proposed resolution
			considerably. <i>Strike this section.</i>	
108	PR	7.2.5	Section 7.2.5 Fault current limiting – This requirement does not apply to the portable power systems used in the entertainment industry. Strike this section.	See the resolution to 106.
109	RB	7.2.5	Section 7.2.5 Fault current limiting – Delete. The 10kAIC limit does not take cable length into account nor is this requirement applicable to the portable power systems used by the entertainment industry.	See the resolution to 106.
110	KW	7.3.3	7.3.3-suggest new language to made it a bit more understandable. <i>“When connecting to existing distribution panels, the authorized; qualified; and where required, appropriately certified personnel; should inform other users of the distribution panel that their loads may be affected should the main breaker be tripped. Of concern in this situation are interior lighting; exit and emergency lighting; computers; phone systems; and elevators.”</i> Should language be added suggesting that using such a panel is to be done only when other options are eliminated?	Accept the proposed new language: “When connecting to existing distribution panels, the authorized; qualified; and where required, appropriately certified personnel; should inform other users of the distribution panel that their loads may be affected should the main breaker be tripped. Of concern in this situation are interior lighting; exit and emergency lighting; computers; phone systems; and elevators.”
111	KW	7.4	7.4-Strike this language as it is onerous, and costly for no perceived need.	Change “shall” to “should” so that a disconnect is not required but suggested. Other standards require a risk assessment when modifying an electrical system; that risk assessment may show that a disconnect is the best solution, or de-energising the system, or working live with appropriate protective equipment.
112	MA	7.4	<u>Section 7.4 - System Expansion</u> Mandatory equipment requirements will impose unnecessary expense to production and it is beyond the responsibility of the standard. It is the responsibility of the employer and the qualified persons they employ to evaluate each individual and unique scenario and utilize the equipment based on demands of production and practical experience. This standard cannot reasonably say this	See the resolution to #111.

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			requirement is necessary in every, or for that matter, any situation. <i>Strike Section 7.4.</i>	
113	AR	7.4	<u>Section 7.4 - System Expansion</u> Mandatory equipment requirements will impose unnecessary expense to production and it is beyond the responsibility of the standard. It is the responsibility of the employer and the qualified persons they employ to evaluate each individual and unique scenario and utilize the equipment based on demands of production and practical experience. This standard cannot reasonably say this requirement is necessary in every, or for that matter, any situation. <i>Strike Section 7.4.</i>	See the resolution to #111.
114	PR	7.4	Section 7.4 Again, while planning for expansion is a nice idea, this should not be part of a national standard. This is better suited to a "Best Practices" document. Qualified Person will evaluate the best and safest way to expand the system, if needed.	See the resolution to #111.
115	RB	7.4	Section 7.4 System Expansion - Delete Section 7.4. Not needed and burdensome.	See the resolution to #111.
116	RB	8.1	Section 8.1 System inspection - Define "qualified and authorized" person to include the person with the show or event as opposed to an outside inspector, if good per AHJ.	Make no change. "Qualified" is already defined. "Authorized" is a regular word, one you can find in any dictionary.
117	RB	8.2	Section 8.2 Energization - Attention to branch breaker loads should be paid heed here. This should read that, " <i>prior to energization of main breakers, all branch breakers/switches should be in the off/open position.</i> " This is mentioned in de-energization, but is far more important during energization than de-energization. The principle of safely turning a system <i>on</i> is far more critical than how it is turned <i>off</i> .	The system inspection in 8.1 requires that all the equipment be off.
118	KW	10	10-strike de-energizing from the title as it is not a real word and should not be used as powering down the system is	Make no change. It's a word. See https://en.wiktionary.org/wiki/de-energize#English

#	Cmmntr	Clause	Comment or reason	Proposed resolution
			sufficient language.	
119	KW	10.1	10.1-rewrite title to "Prior to powering down the system"	Make no change. No argument is offered for why the title should bve rewritten.
120	MA	10.1	<p><u>Section 10.1 - Prior to de-energization</u></p> <p>Practical experience demonstrates that it is not necessary, and in many cases not reasonably possible, to lower all elevated equipment. Truss suspended by chain motors and lighting pipes are designed to remain in an elevated position and are frequently suspended over scenery and other fixed objects creating an unnecessary, difficult, and expensive requirement to lower them at the end of each work shift.</p> <p><i>Strike "that all raised or elevated equipment is lowered and".</i></p>	Accept. You are correct in that we do not want to necessarily have to lower all lighting trusses.
121	AR	10.1	<p><u>Section 10.1 - Prior to de-energization</u></p> <p>Practical experience demonstrates that it is not necessary, and in many cases not reasonably possible, to lower all elevated equipment. Truss suspended by chain motors and lighting pipes are designed to remain in an elevated position and are frequently suspended over scenery and other fixed objects creating an unnecessary, difficult, and expensive requirement to lower them at the end of each work shift.</p> <p><i>Strike "that all raised or elevated equipment is lowered and".</i></p>	See the resolution to #120.
122	RB	10.1	Section 10.1 Prior to de-energization - Ensuring that ALL raised or elevated equipment is "lowered" is not practical, certainly not with chain motors or rigging systems. There often may be a need to shutdown completely with gear in the air. Suggest that perhaps what is intended here can be better facilitated by prefacing with, " <i>Prior to final de-energization of temporary power systems...</i> "	See the resolution to 120.
123	KW	10.2	<p>10.2-rewrite the title to "Powering down the system". Also rewrite last sentence to read as follows:</p> <p><i>"Only qualified; authorized; and where required, appropriately certified personnel shall de-energize any</i></p>	<p>Make no change to the title. "De-energizing" is a word. "Powering down" might be to lower something.</p> <p>Make no change to the last sentence. The change would require equipment to be turned off only by</p>

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			<i>power system, or portion thereof.</i> "	qualifid and authorized personnel.
124	MA	10.2	<p><u>Section 10.2 - De-energizing the system</u></p> <p>This is not always possible on the professional working stage/set as there are times when switches for "loads within a branch" are inaccessible due to where the equipment is rigged for the production, such as is the case with moving lights on a truss. Entertainment distribution equipment uses switch rated circuit breakers so the breakers can safely be used to turn off the loads.</p> <p><i>Change first sentence to read: "Turn off all switches on the power distribution equipment on the branch circuit prior to turning off the branch circuit. Repeat for all branches."</i></p>	It's not always a good idea to kill the power to electronic equipment before it is shut off, but, indeed, sometimes the off switch on equipment is inaccessible. Change to read: "Switch off all loads within a branch at the load, <u>if possible</u> , followed by switching off that branch . . . "
125	AR	10.2	<p><u>Section 10.2 - De-energizing the system</u></p> <p>This is not always possible on the professional working stage/set as there are times when switches for "loads within a branch" are inaccessible due to where the equipment is rigged for the production, such as is the case with moving lights on a truss. Entertainment distribution equipment uses switch rated circuit breakers so the breakers can safely be used to turn off the loads.</p> <p><i>Change first sentence to read: "Turn off all switches on the power distribution equipment on the branch circuit prior to turning off the branch circuit. Repeat for all branches."</i></p>	See the resolution to 124.
126	RB	10.2	<p>Section 10.2 De-energizing the system - This is impractical depending on how far down the branches you are going. There are times that branch breakers and all loads "within a branch" may not be accessible, such as in moving lights in the air or motor PDs mounted to truss. Suggest limiting this to "main breakers on all Power Distribution equipment" at a minimum. Generally speaking, whomever kills those mains will quite likely have killed the branch breakers on the PD already. While this is a good practice, it is more important to do the reverse on energization and this is not mentioned in energization at present.</p>	See the resolution to 124.

#	Cmmntr	Clause	Comment or reason	Proposed resolution
127	KW	11	<p>11-this section should be rewritten as below, and all other sections should be renumbered:</p> <p style="text-align: center;"><i>11.1 Disconnection</i></p> <p style="text-align: center;"><i>1) Removal of any system components should commence after the system has been de-energized, where possible;</i></p> <p style="text-align: center;"><i>2) When disconnecting the connections closest to the power source should be the first to be removed from the power source when practicable;</i></p> <p style="text-align: center;"><i>3) All phase (line) conductors shall be disconnected first, followed by the neutral (identified conductor) and lastly the bond conductor.</i></p>	Make no change. You renumbered the clauses. Nothing is substantively changed.
128	JE	11.4	Section 11.4 - you don't 'de-energise isolation switches' to turn off parts of a system, you <i>operate</i> the switch which de-energises the downstream circuit. Reword accordingly.	Make no change. The referenced text does not exist in the public review document.
129	KW	11.5	<p>11.5-this language is onerous as the time of removal may not be the right time to do a good inspection of the cable due to possible time constraints of the wrap and removal process. I would suggest the following language:</p> <p style="text-align: center;"><i>“At an appropriate time after removal from site, and before storage, all cable and connectors shall be inspected for damages. All defective units shall be identified and set aside for repair.”</i></p>	Change “shall” to “should.” As MA notes, the rental house has the responsibility of checking the equipment before it is rented again. If the equipment is owned by the production company, a careful inspection should be done before it goes out again. Damage can occur in packing, transit, and storage.
130	MA	11.5	<p><u>Section 11.5 - Cable removal</u></p> <p>This puts an unnecessary expense on production as the employer holds no responsibility to provide the time or otherwise pay for equipment to be “inspected” during the removal of the cable. It is the responsibility of the rental shop to do the inspection.</p> <p><i>Strike the first line.</i></p>	See the resolution to #130.
131	AR	11.5	<p><u>Section 11.5 - Cable removal</u></p> <p>This puts an unnecessary expense on production as the</p>	See the resolution to #130.

#	Cmmntr	Clause	Comment or reason	Proposed resolution
			<p>employer holds no responsibility to provide the time or otherwise pay for equipment to be "inspected" during the removal of the cable. It is the responsibility of the rental shop to do the inspection.</p> <p><i>Strike the first line.</i></p>	
132	RB	11.5	<p>Section 11.5 Cable removal - This is an absurd proposition in reality. Cable is inspected in the shop prior to the next use. That is not to say that defective cable should not be marked on removal, however demanding inspection of all cable during removal is not practical and could open one up to liability for violating the "rules" on a load-out. <i>Delete clause about inspection.</i> Leave in clause about Defective cable being marked and set aside.</p>	See the resolution to #130.