



SAFETY CODES COUNCIL

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ALBERTA ELECTRICAL INDUSTRY CODES AND TECHNICAL CONFERENCE

Fairmont Chateau Lake Louise
111 Lake Louise Drive
Lake Louise, Alberta T0L 1E0

Meeting Notes

Day One (June 11, 2008)

CE Code Committee and O&G Code Committee

- 1. Coffee**
- 2. Opening Remarks 9:00 a.m.**

Stan Misyk Conference Co-Chair, called the meeting to order at 9:00 a.m. All participants introduced themselves. (Attachment #1) The ETC Council Members were introduced.

There were 39 participants in attendance. It was noted that Gary Boswell, John Bronius, Rene Leduc, Clem Gratton, Kevin Harrison, Denis Holmes, Ron Mah, Bill McAllister and Jim Grayson from the Electrical Technical Council were in attendance.

- 3. Adoption of Agenda**

Item 8.1, ETC report, was added to the agenda.

- 4. Safety Codes Council**

Gerry Baron brought greetings on behalf of the Safety Codes Council.

The Safety Codes Council expressed appreciation to the participants of AEICTC and noted conferences such as these add value to the safety system. One question about communication permits was asked but deferred to later in the meeting so it could be answered by a Municipal Affairs representative.

5. Meeting Notes of May 2, 2007 meeting – Jasper

The meeting notes were circulated and reviewed (agenda attachment #1).

Consensus was reached that the meeting notes be accepted as circulated.

6. Presentation – CSA-Z462 Terry Becker ESPS Electrical Safety Program

Highlights of the presentation included:

- Public review draft is available
- Seeking final approval June 23, 2008
- Publication October/November 2008
- French edition 1st quarter of 2009
- If adopted CSA-Z462 will be administered by OH&S

A video produced by the Electrical Safety Authority was shown.

Video highlights included:

- CSA-Z462 history
- CSA-Z462 timeline
- CSA-Z462 status
- CEC Part I Rule 2-306

The presentation will be included in the meeting notes (Attachment #2) [McDonald]

The draft document is to be provided to the ETC.

[McDonald]

7. Summary of STANDATA issued over the last year

The Chief Electrical Inspector provided a brief overview of the STANDATA revisions – Issue #16 – October 2007 and Issue #17 – April 2008. A summary of each revision was provided.

It was reported that there has been a vast increase in the number of notices and recalls that have been issued. Notices and recalls will no longer be sent out in the STANDATA packages, links to the notices and recalls are available on the Municipal Affairs website.

8. Subcommittee reports

8.1 ETC report

Gary Boswell thanked members of the ETC, all sub-committee members, volunteers and the companies that sponsor the volunteer members.

Highlight of the report include:

- 4 meetings since the last AEICTC
- The Relocatable Structures Sub-committee has a consensus on labelling requirements
- There will be a submission to CSA Part I Section 70, seeking clarification on what is included in the scope of Section 70 i.e., industrial skids.
- ETC received information on OBIEC
- ETC received information on the Masters Program
- A taskforce on SCO entry requirements was concluded
- Submissions by the Utility, Oil and Gas, and CE Code advisory committees have been reviewed through the year.

8.2 CE Code Committee report

Stan Misyk gave the CE Code Advisory Committee report (agenda attachment #3)

8.3 O&G Code Committee report

Rene Leduc gave the Oil and Gas Facilities Code Advisory Committee report (agenda attachment #4).

There was discussion on whether there is a need to publish a 2009 Code for Electrical Installations At Oil And Gas Facilities as all changes are editorial with no rule changes.

Erin Foster-O'Riordan, manager of Codes and Standards, was introduced and requested to answer a question on the Permit Regulation and whether there will be a change requiring communication permits. Erin's answer was that the issue is under review but current legislation does not require a permit for communication installations.

9. Agenda Items for discussion (agenda attachments #5 thru #19)

9.1 CEC Rule 2-306

Terry Becker raised a concern that this rule is being misinterpreted by Electrical Safety Codes Officers. It was explained that some SCOs are asking for a detailed warning label outlining PPE requirements rather than a simple warning label.

The proposal as presented is as follows:

Issue a Standata that clarifies the requirements and illustrates an example of the simple label. Annex Q of the public review draft of CSA Standard CSA Z462 Workplace Electrical Safety further clarifies Arc Flash & Shock Labeling and can be used a reference.

There was consensus that the ETC issue a STANDATA.

[McDonald]

9.2 CEC Rule 6-206

Rule 6-206 requires service equipment to be placed within a building, however there is a combination meter base and main disconnect on the market that is approved for service entrance and suitable to be mounted outdoors.

Some authorities are accepting service boxes on the outside of buildings while others do not accept service boxes on the outside of buildings. It was suggested that there should be a consistent approach when enforcing Rule 6-206.

The proposal as presented is as follows:

The Rule should be re-worded to say "placed in or on a building being served".

There was a consensus to make a submission to CSA Part I for a rule change as well as having the Administrator issue a province wide variance.

[CE Code Committee]

9.3 Diagram 2 Receptacle Configuration

The ECAA (DR Sparkie's Electric) brought forth a concern about a 30 A 125/250 V male cord end twistlock being inserted into a 3 phase, 30 A, 480 V receptacle. After some discussion it was reported that Nema (US) receptacles might fit CSA configuration however suggested male cord ends should not be forced into receptacles.

This concern was reviewed as information only, no action required.

9.4 CEC Rule 6-302

The ECAA (Panda Electric Ltd.) brought forth a concern with a recommendation that concentric neutral cable should be acceptable when run between the meter base and the service box for an overhead service.

This issue has been before the ETC previously and it was decided to uphold the decision of the ETC not to accept concentric neutral cable between the meter base and the service box on overhead services.

9.5 CEC Rule 76-016

The ECAA (B.D.W. Electrical Installations Ltd.) brought forth a concern relating to the tripping of GFCI breakers when used for temporary service receptacles.

Pierre indicated when other provinces were polled, only B.C. reported a problem with nuisance tripping. Pierre indicated this issue is before CSA and discussions are ongoing.

It was decided no change to the rules are required at this time.

9.6 CEC Rule 26-700 (11)

The ECAA (Mustang Electric Ltd.) brought forth a concern related to the unnecessary cost for a GFCI on receptacles in a kitchen within 1.5 m of a sink.

There was consensus that this rule adds safety and the AEICTC does not support a change to the rule.

9.7 CEC Rule 12-3022

Stan Misyk, representing the EIAA, requested the addition of a rule to the CEC for cable connectors to be required when tray cable terminates at boxes, panels etc. There were a number of slides shown where tray cable enters a conduit sleeve without the use of a cable connector.

The AEICTC decided to send this issue to the CE Code Advisory Committee for a recommendation to the ETC.

[CE Code Committee]

9.8 CEC Rules 4-022 and 6-308

Stan Misyk, representing the EIAA, brought forth a concern about one utility company asking for a full size neutral the same as the circuit conductor for metering purposes, rather than using the bonding conductor in a 3 conductor teck cable.

It was decided this issue should be discussed at the Utility meeting on June 12.

Note: At the Utility meeting it was suggested the concern may be with one district utility office and perhaps the issue can be resolved by discussing this issue with the particular utility involved.

Stan Misyk will forward that information to the individual with the concern.

[Stan Misyk]

9.9 CEC Rules 18-092(1)(2), 18-108(1)(2) and 18-158(1)(2)

Stan Misyk, representing the EIAA, asked if it is necessary to install secondary seals when existing devices are replaced with identical devices not bearing the marking dual or single seal. It was suggested a Standata should be published to give the industry guidance.

Corporations present at the meeting indicated there are a number of factors to be considered when deciding if a secondary seal should be installed in an existing installation. Not all situations are the same and it should be left up to the corporation to decide if it is necessary to install a secondary seal when devices are replaced.

The AEICTC agreed with the rational put forth by the corporations and decided there is no need for a STANDATA.

9.10 Secondary Seals – April / 2008 STANDATA

Stan Misyk, representing the EIAA, asked how much longer are we going to accept declarations from manufacturers that they have submitted their product to a Certification Body for approval.

Pierre will check with certification organizations to determine the status of those manufacturers trying to get their product approved. If certification organizations are up to date with their approvals, Pierre will look at issuing a new STANDATA in September or October 2008.

[McDonald}

9.11 CEC Rule 26-710(m)

There was a submission from Grotrian Electrical Tech to change rule 26-710(m) with a proposal to have at least one 20 A receptacle and #12 AWG circuit for each cord connected central vacuum system.

A residential contractor indicated vacuum systems come with a 15 A cord cap and to date his company has never had a problem with a 15 A receptacle. Others indicated that if you purchase specialized appliances you must wire accordingly.

AEICTC decided to review this submission for information only.

9.12 CEC Rule 10-618(4)

Jim Bradshaw, Tracer Industries Canada Limited, brought forth a concern regarding stainless steel mineral insulated heat tracing; do junction boxes and MI connectors used to connect MI cables require an independent bonding conductor

There was much discussion; some viewed the junction box or connector as an extension of the heating cable therefore not requiring a bonding conductor in the cable while others indicated that the heating cable with the junction box or MI connector is not approved as an assembly but rather is a field installation.

AEICTC decided that this issue should be forwarded to the CE Code Advisory Committee for further research and recommendation to the ETC. There was consensus that a STANDATA should be published giving industry direction.

[CE Code Committee]

9.13 UG Cable connection to meter

Zoltan Nagy, Superior Safety Codes, submitted a concern over liability; an electrical contractor does not want to take responsibility for the service connection at the meter as he did not install the underground portion of the cable.

The cable connection at the meter is made by various different individuals, the electrical contractor, the UG contractor or the utility. This concern was not considered a code issue.

AEICTC decided to receive this concern for information only, no action required.

9.14 UG Cable pulling out of meters

Zoltan Nagy, Superior Safety Codes, submitted a concern about service cables pulling out of meters and causing fires. The proposal called for a conduit with a 90 degree bend at the bottom of the trench.

There were many installation methods discussed. Some were of the opinion that a 90 degree bend may cause more problems than it would solve. It was agreed most problems arise from poor installation practices. It is felt that no matter what the installation method, if done properly no problems arise.

AEICTC decided to receive this concern for information only, no action required.

9.15 Access to electrical equipment

Mike Zelenak, City of Edmonton, submitted a concern about electrical equipment such as transformers, motor starters, etc. being installed in ceiling spaces where an electrician can not gain access.

The AEICTC reminded contractors to abide by the code rules already in place, and inspectors to enforce the rules already in place.

AEICTC decided to receive this concern for information only, no action required.

10. Other Business

Rene Leduc thanked everyone for their participation. Rene advised that the AEICTC is looking for ways to improve the meeting, perhaps more industry presentations such as today's presentation on the CSA Z462 standard. If anyone has a topic they would like a presentation on please advise Rene.

11. Adjournment

The meeting was adjourned at 3:45 p.m.

**2008 AEICTC -Canadian Electrical Code, Oil and Gas Code Meetings
Sign-in Sheet**

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CSA Z462 Status

AB Electrical Industry Codes & Technical Conference

June 11, 2008

Terry Becker, P.Eng., CEO

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Overview of Presentation

- Introduction, Terry Becker, P.Eng.
- CSA Z462 History
- CSA Z462 Timeline
- CSA Z462 Status
- CEC Part 1, Rule 2-306
- Regulatory change, AB OH&S, Part 18 PPE and SK, Part 7, Skin Protection.
- Challenges.
- Questions?

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Terry Becker, P.Eng.

- Over 17 years experience in electrical engineering, owner and consulting.
- CSA Z462 Technical Committee, First Past Vice-Chair, Executive, Annex Working Group Leader.
- Professional Engineer, BC, AB and ON.
- AB Arc Flash Hazard Committee, Founder and Chair, 2005-2006.

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Terry Becker, P.Eng.

- NFPA 70E Liaison Member, CSA Z462 Vice-Chair Role.
- Founder, CEO, ESPS Electrical Safety Program Solutions INC. www.esps.ca.

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CSA Z462 History

- CSA Z460 Control of hazardous energy and other methods 2006 identified NFPA 70E.
- AB Arc Flash Hazard Committee identified NFPA 70E.
- CEC Part 1 TC reviewed NEC Article 110.16 equivalent to Rule 2-306 and adopted Rule 2-306.
- CSA signs historical MOU with NFPA to harmonize standards for North America.

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CSA Z462 History

- NFPA 70E selected as one of the first Standards to harmonize, CSA Z462 proposed due to interest level.
- January 2006 TC put forward and structured through to October.
- 36 voting members, following CSA Matrix. Across Canada representation. Industry, suppliers/manufacturers, regulator... Six (6) Provincial OH&S Officers.

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CSA Z462 Timeline

- CSA Z462 Workplace Electrical Safety Standard, 1st Edition, 2009.
 - Adaptation and adoption of NFPA 70E to Canada, National Standard of Canada, non-mandatory unless adopted into law by Provinces & Territories.
 - December 2005, CSA announces historical agreement with NFPA to harmonize Standards for North America.
 - January 1, 2006, CSA announces one of the first standards that will be harmonized is NFPA 70E “Standard for Electrical Safety in the Workplace,” as CSA Z462 Workplace Electrical Safety Standard.
 - CSA Z462 Technical Committee constituted, first meeting October 2006.

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CSA Z462 Timeline

- CSA Z462 Workplace Electrical Safety Standard, 1st Edition, 2009.
 - Second, Meeting February 2007.
 - Third Meeting, June 2007.
 - Fourth Meeting, October 2007.
 - Fifth Meeting, March 2008.
 - CSA Z462, Preprint for Stakeholder review April/May 2008 (download until beginning of July).
 - Sixth Meeting, June 2008 – Approve FINAL DRAFT.
 - Seventh Meeting, September 2008.
 - CSA Z462 Approved October/November 2008. French edition 1st Quarter 2009.

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CSA Z462 Status – Technically Harmonized!

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CSA Z462 Status – Public Review Draft Issued & Expired June 6, 2008 – 35 Pages of Comments

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CSA Z462 Status

- Harmonize with NEC & CEC, Chapter 4 deleted no conflict or overlap with installation code.
- CSA Z462 latitude to add or modify Annexes, several added.
- CSA Z462 in the CSA OH&S family of Standards.
- Aligned with 2009, 7th Edition of NFPA 70E which is approved in Las Vegas last week.
- Exclusions retained in CSA Z462 and NFPA 70E.

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New Consensus Based Standards
Industry Best Practices

• CSA Z462 Contents:

MAIN BODY MANDATORY REQUIREMENTS	ANNEXES NON-MANDATORY, RESOURCES
1. Scope Chapter 1 – 70E	Annex A – Aligning Implementation of Z462 with OHSMS Standards
2. Reference Publications	Annex B – Safety Related Electrical Maintenance
3. Definitions	Annex C – Limits of Approach
4. Safety-Related Work Practices	Annex D – Incident Energy and Arc Flash Protection Boundary Calculation Methods
5. Safety-Related Maintenance Practices	Annex E – Electrical Safety Program
6. Safety Requirements for Special Equipment	Annex F – Hazard / Risk Evaluation / Assessment Process
Chapter 3 – 70E	
Chapter 2 – 70E	
Chapter 4 – Installation Safety Requirements - DELETED	

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- CSA Z462 Contents:

**MAIN BODY
MANDATORY REQUIREMENTS**

1. Scope
2. Reference Publications
3. Definitions
4. **Safety-Related Work Practices**
5. Safety-Related Maintenance Practices
6. Safety Requirements for Special Equipment

Clause 4, 5 and 6 are Chapter 1, 2 and 3 of 70E.

**ANNEXES
NON-MANDATORY, RESOURCES**

Annex G - Sample lockout policy, (CSA Z460 referenced)
 Annex H - Simplified, Two-Category, FR Clothing System
 Annex I - Job Briefing and Planning Checklist
 Annex J - Energized Electrical Work Permit
 Annex K - General Categories of Electrical Hazards
 Annex L - Typical Application of Safeguards in the Cell Line Working Zone.

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- CSA Z462 Contents:

**MAIN BODY
MANDATORY REQUIREMENTS**

1. Scope
2. Reference Publications
3. Definitions
4. **Safety-Related Work Practices**
5. Safety-Related Maintenance Practices
6. Safety Requirements for Special Equipment

**ANNEXES
NON-MANDATORY, RESOURCES**

Annex M - Layering of Protective Clothing and Total System Arc Rating
Annex N - Arc Rating, Arc Thermal Performance Value (ATPV) and Breakopen Threshold Energy (Ebt)
Annex O - ... Overhead lines and equipment.
Annex P - Safety related Design Requirements
Annex Q - Electrical Hazard Labels, Arc Flash and Shock Labeling

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CSA Z462 Status - Highlights

- Chapter 4 Installation Safety Requirements - DELETED
- Confusion in the use of different words and phrases clarified.
 - For example the word "live" replaced with "energized." Energized appeared 81 times and live 71 times in 2004 Edition of 70E.
 - Other changes made.
- Table 130.7(C)(9)(a) changes:
 - Table 4 in Z462.
 - Wording changes
 - cont... next page

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CSA Z462 Status - Highlights

- Table 130.7(C)(9)(a) changes:
 - New tasks added:
 - IR Thermography
 - Work on utilization equipment fed directly by branch circuit or panelboard
 - Racking equipment in arc resistant SWGR.
- Eliminated HRC -1 from Table 130.7 (C) (10).
 - Also clarified descriptions of electrical specific PPE, table easier to read.

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CSA Z462 Status - Highlights

- Eliminated HRC -1 from Table 130.7 (C) (10) cont...
 - Notes changed lots of clarification.
 - Also clarified descriptions of electrical specific PPE, table easier to read.
 - Hearing protection added for HRC 0 and 1, 140db risk.
 - Leather gloves added for HRC 1 for arc flash protection
- Equipment labeling added. Incident energy or HRC level.

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CSA Z462 Status - Highlights

- Total System Arc Rating for arc flash (FR) clothing, undergarments no longer considered. Layered ATPV, test data ASTM 1959.
- Arc Flash Hazard Analysis exception now noted, not required if (Z462 4.3.3 Arc Flash Hazard Analysis, from IEEE 1584):
 - Voltage 240V or less
 - Circuit supplied by one transformer
 - Transformer 125kVA or less

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CSA Z462 Status - Highlights

- Generally no major changes other than Chapter 4 Deleted and CSA Z462 added Annexes.
- Clarification on use of terms and phrases.
- Tables improved, clarity and easier to read.

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The Law – CEC Part 1 Compliance

- Canadian Electrical Code, Part 1, Rule 2-306:
 - (1) Electrical equipment such as switchboards, panel boards, industrial control panels, meter socket enclosures, and motor control centers that are installed in other than dwelling units and are likely to require examination, adjustment, servicing, or maintenance while energized shall be field marked to warn persons of potential electric shock and arc flash hazards.
 - (2) The marking referred to in Subrule (1) shall be located so that it is clearly visible to persons before examination, adjustment, servicing, or maintenance of the equipment.
- Simple Arc Flash & Shock Label:
 - Meets minimum requirements of CEC.
 - NFPA 70E in Appendix B, IEEE 1584.
 - **MANDATORY**



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The Law – CEC Part 1 Compliance

- Canadian Electrical Code, Part 1, Rule 2-306, **NON MANDATORY**. Requires detailed P.Eng. study and report :

FLASH PROTECTION		SHOCK PROTECTION	
Flash Hazard at	18 inches	Shock Hazard when cover is removed	600 VAC
Flash Hazard Rating	5.0 cal/cm ²	Limited Approach	42 inch
Flash Prot. Boundary	43 inch	Restricted Approach	12 inch
Glove Class	0	Prohibited Approach	1 inch
Clothing Category	# 2		
Cotton underwear plus FR shirt and FR pants			
Equipment Name: MCC#3		February 5, 2008. Std IEEE 1584	
Arc Flash Study by: XYZ Consulting		File: "ABC PLANT Rev X.yz"	

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OH&S Regulatory Change

- AB in 2004, added in more specific language on arc flash:
- AB, OH&S, Section 18 Personal Protective Equipment:
 - 232 (1) If a worker may be exposed to a flash fire or **electrical equipment flashover**, an employer **must** ensure that the worker **wears flame resistant** outerwear and **uses other protective equipment appropriate to the hazard**.
 - 232 (2) A worker must ensure that clothing worn beneath flame resistant outerwear and against the skin is made of flame resistant fabrics or natural fibres that will not melt when exposed to heat.

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OH&S Regulatory Change

- SK in October 2007 added in very specific language on arc flash:
 - **SK, OH&S, Part VII, Section 94 Skin Protection, "(3) Where there is a risk of injury to the skin of an electrical worker from arc flash, an employer or contractor shall provide the electrical worker with, and require the electrical worker to use, arc flash protection that meets an approved standard."**

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OH&S Regulatory Change

- SK also added in requirement of high voltage safety training and is creating a guideline to advise what is required:
 - 1.1 An employer or contractor shall ensure that a qualified electrical worker has had approved training in high voltage safety.
 - 1.2 No qualified electrical worker shall undertake high voltage electrical work unless the worker:
 - (a) has written proof of approved training in high voltage electrical safety; and
 - (b) has that written proof of approved training readily accessible at all times while working near energized high voltage electrical conductors."

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Challenges

- AB Electrician Apprenticeship Course Outline not aligned with CSA Z462. Instructors not up to speed on NFPA 70E / CSA Z462.
- Industry in general not aware.
- Provincial Regulator making changes to OH&S Regulations, not consistent. SK has most significant language.
- AFHA without addressing PPE, training and procedures is not the solution.

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Questions?

- June 23-24, 2008, St Johns, NFLD, CSA Z462 will be approved by the TC and provided to CSA for final approvals.
- THANK YOU FOR LISTENING, ANY QUESTIONS?
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