Auditor Debrief

November 7, 2019

Disclaimer

- The information in this presentation was prepared as discussion points for the auditor meeting. In some cases more information may be required to understand the issue fully as discussed during the meeting. For more information please contact jason.hrycyshyn@electricalsafety.on.ca or *Utility.Regulations@electricalsafety.on.ca*.

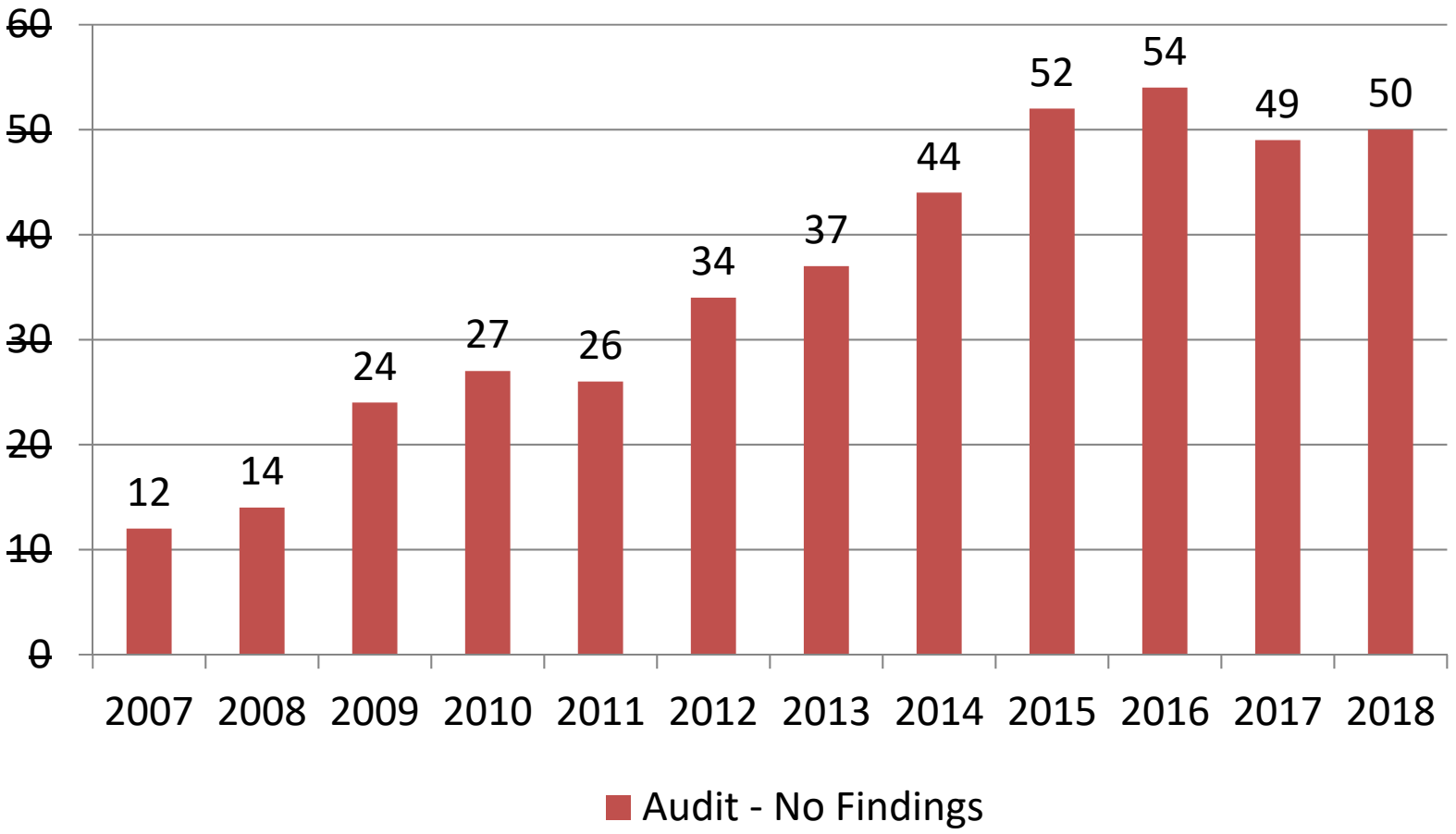
AGENDA

1. Review of 2018 Audit results
2. Key 2018 Audit Findings
3. Possible Future of Electrical Distribution
4. 2019 Questions & Issues / Auditor Feedback
5. Focus of 2019 Audits
6. Other Information
    a) Bulletins
    b) Other Issues

Summary of Audit Findings for 2018

- Total of 67 LDC Audit reports
- 50 LDCs - Full Compliance (‘17-49)
- 3 LDCs with Non-Compliance findings
- 14 LDCs - Needs Improvement only
- 7 LDCs with only one finding (NI or NC)
- 10 LDCs with two or more findings (NC or NI)
- *2 LDCs had more than 1 Non-compliance
    - *Both these LDCs were merging or being acquired by a larger, compliant LDC.

Summary of
Audit Findings Life to Date



Section 4/5 Audit Findings

Section 4/5 – Safety Standards

- Inspection programs not meeting the minimum requirements of Appendix C of the Distribution System Code.
- Most of the findings were associated with LDCs that were being merged or acquired into larger, compliance LDCs.

Section 6 Audit Findings

- Nothing appears to be common.

Section 7 Audit Findings

Section 7 – Approval of plans, drawings and specifications for installation work

- 3rd Party work issues:
  - Work doesn't reference the approved standards. This may relate to confusion/misuse of "materially insignificant".
  - Bulletin to be reviewed here
- Confirmation of software for non-linear design.

Section 8 Audit Findings

- Nothing appears to be common.

Regulator's View of a Changing Distribution Sector

The following are possible outcomes ESA is keeping an eye on

Possible Changes to Distribution

- Slide showing the disruptive events since the beginnings of the distribution system.
- Highlights included:
  - Electric Vehicles
  - DERs
  - Blockchain/Hashgraph Technologies
  - High pentration solar
  - IoT

Possible Changes to Distribution

DERs

- **At the time Regulation 22/04 came into force, DERs were not even a consideration.**

- ESA with the help of industry stakeholders, over 1 year ago, created a system to include DERs under the existing Regulation. Guideline was issued last year and has been revised. The new revision was released October 2019.

- The Guideline provides direction for LDCs on what equipment can be installed under Regulation 22/04 and what cannot. The Guideline is technology agnostic and focuses on the Primary Application of the equipment.
  - 8 Applications are listed as “typically covered under Regulation 22/04”;
  - 5 Applications are listed as “**not** typically covered under Regulation 22/04”.

Possible Changes to Distribution

The Most Critical Technical Challenge in the Next 15 Years

At the National Summit, participants were asked their opinions on the most critical technology challenge that will need to be addressed in the next 15 years. They identified the management of DERs and achieving cost-effective energy storage as the biggest challenges. (See Figure 3, which shows the polling results from National Summit participants, echoing discussions in the regional workshops.)

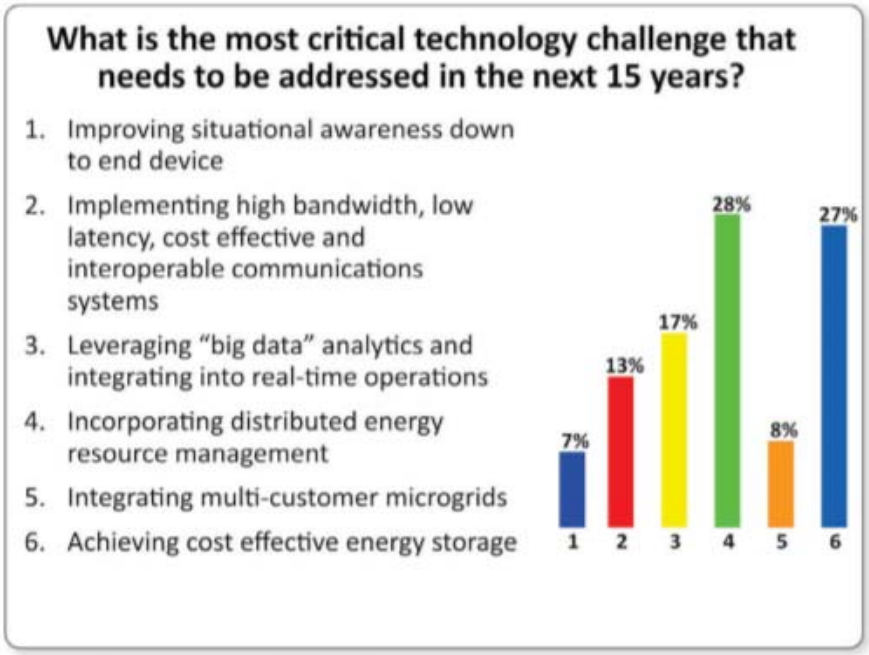
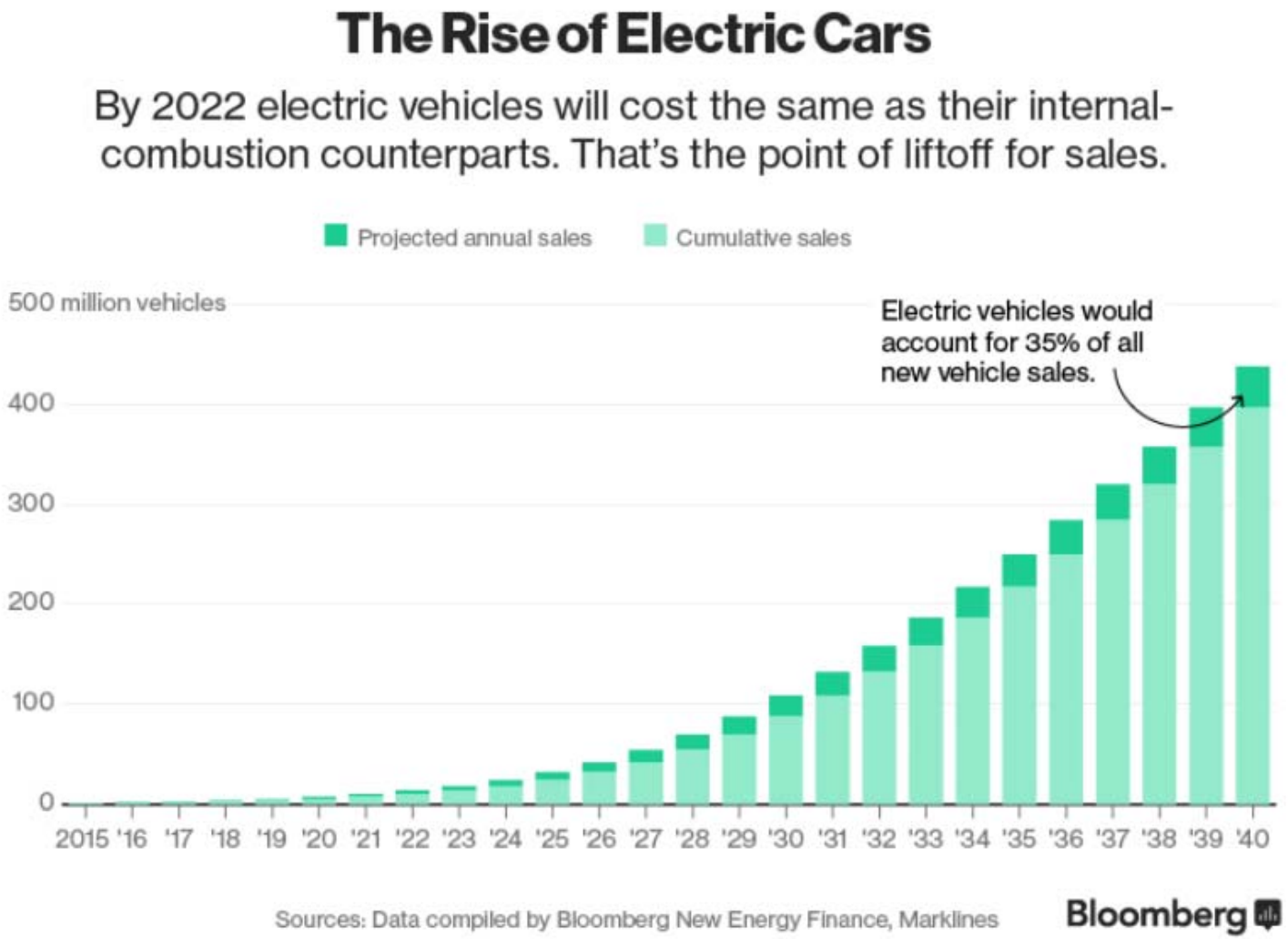
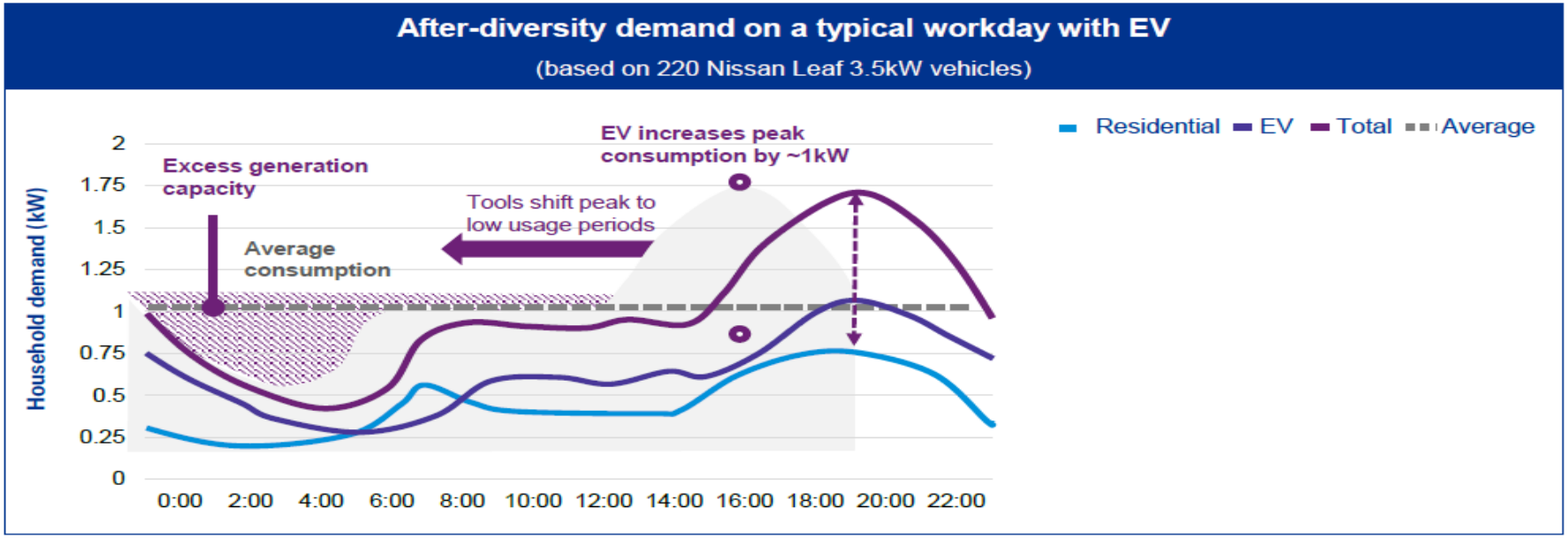


Figure 3. National Summit polling results – critical technology challenges

Possible Changes to Distribution



Possible Changes to Distribution



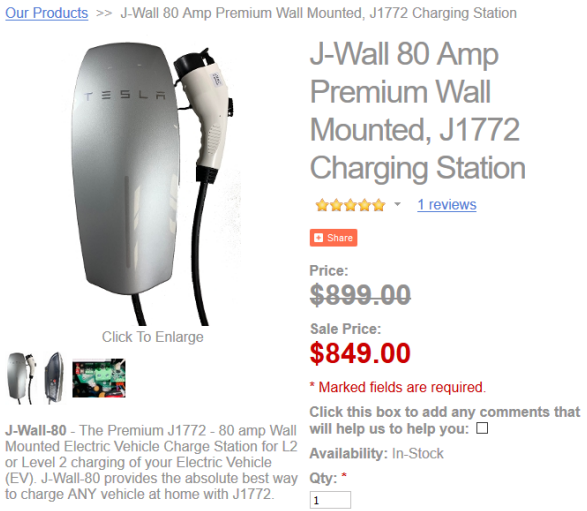
- Average per-household demand will **double if EVs charge at peak hours**
- Improving charge technologies (7-11kW) will **exacerbate local demand spikes** without the intervention of flexible tools

Source(s) (1) My Electric Avenue Project Trial Results, 2014-2017, Ofgem;
(2) Electric Vehicle Insight Report, Network Revolution, 2014

Now… what happens with 2 chargers, wireless charging and a high penetration of Solar??? The demand is even lower until people come home and the demand becomes much higher.

Possible Changes to Distribution

Slide showing wireless charging and there was a discussion regarding efficiency and the size of the load EVs present.



Some manufacturers are claiming 91-93% charging efficiency from grid to battery. If the wireless charger is 40-60% efficient.
Some of other information suggests wireless charging is much less, which means wireless charging could mean significantly extra load on the electrical system.
This means that every EV on the street equals about 1 home and if the EV is wirelessly charged this could be 1 additional home.

Possible Changes to Distribution

ESA is monitoring many things, including the “prosumer” concept and the ability of transacting between your customers.

Blockchain/Hashgraph/Micro-Payments are commonly used in this space.

There are a number of changes that can significantly impact the electrical distributors and the regulator is participating and monitoring events as they unfold.

Prosumer Diagram

Possible Changes to Distribution

ESA is looking into CSA S250 and Z463, and the applicability of these standards for use in Regulation 22/04.

S250 - Mapping of Underground Utility Infrastructure.

CSA S250 sets out requirements for classifying the accuracy of newly installed or exposed infrastructure. The CSA S250 accuracy levels provide a finer level of detail to define the positional location of the infrastructure which translates into a better defined reliability in the accuracy of the record. CSA S250 compliments rather than replaces ASCE 38-02.

Z463 (Alternative) – ***Maintenance of electrical utility generation, transmission, and distribution systems, telecommunication networks and railways***

Proposed new standard on maintenance of Utility Systems, that can be referenced in a future edition of CSA 463.

Possible Changes to Distribution

ESA is looking into what ESA can offer to Stakeholders under the Open Access Data.

ESA is starting to review what data do we have that could benefit others and what are the impacts of sharing that data.

For example, does ESA have data that would benefit LDC planning in regards to DERs behind the meter?

Auditor Question – From 2018

- Q. When are they updating the Technical Guidelines? There are many that are out of date and impact operations.

A. It is expected that within the calendar year 2020 the program to put Guidelines on a 5 year review period will begin. Regulator Staffing has to be addressed first.

Auditor Question

Proposed schedule – Order in which to address guidelines (Note 1)

1) Year 1 - Guideline for Excavation in the Vicinity of Utility Lines (Section 10)
2) Year 1 - Guideline for Third Party Attachments (Section 7 & 8) – (Note 2)
3) Year 2 - Technical Guideline (Section 7)
4) Year 2 - Technical Guideline (Section 8)
5) Year 3 - Technical Guideline (Section 6)

Note 1: Order may be changed as needed to address new requirements, stakeholder feedback, etc (e.g. Regulation amendments).

Note 2: Review includes assessing to incorporate into Technical Guidelines, either as 4th section or incorporate into sections 7 & 8.

Proposed schedule – Order in which to address guidelines

6) Year 4 - Guideline for Change of Ownership (Section 3) (Note 3)
7) Year 4 - Guideline for Proximity to Distribution Lines (Section 10)
8) Year 4 - Guideline for Disconnecting Unused Lines (Section 11)
9) Year 5 - Guideline for Reporting of Serious Electrical Incidents (Section 12)
10) Year 5 - Guideline for Audit (Section 13)
11) Year 5 - Guideline for Declaration of Compliance (Section 14)

Note 3: Main participation is ESA internal, specifically Operations group since they perform inspections of equipment/installations to be transferred

Auditor Question

Q. Can the 22-04 audit be conducted less frequently, moving from annual to every two years or even on a lottery based on past outcomes? I think that LDC's should still produce evidence annually that the CVP process is followed, in compliance and signed off by senior staff.

A. The Regulation requires an annual audit. Until such time as the Regulation amendments are enacted the annual audit will still be a requirement.

Auditor Question

Q. Will there be a plan for ESA to verify if indeed the LDCs are in compliance with Sections 3,9,10,11 and 12 that they self declare they are in compliance every year? I suggest that their self-declared compliance to these sections should be verified randomly. “

A. The Regulation requires an annual self declaration, be submitted. Until such time as the Regulation amendments are enacted ESA will not perform checks without wording such as in Section 8 referring to “keeping the information and making it available to the Authority on request”.

Auditor Question

Q. Recently, it was brought to our attention that ESA is planning on to perform site inspections three times per week (Mondays, Wednesdays and Fridays) rather than only twice per week as it has been in the past (Tuesdays and Fridays). It is also our understanding that ESA did not consult with LDCs prior to make such decision.

GPI's operation processes, procedures and timings, specially for new connections and cut & reconnects requests, may be significantly affected due to the increase on the frequency of ESA's inspections, therefore we would like to know what was the ESA rationale as to implement these changes without having taken into consideration LDC's operability and performance indicators through which OEB benchmarks all of them

A. This is not a Regulation 22/04 question, this question was forwarded to the Territorial General Manager and local Inspector.

Auditor Question

Recently I completed my DDI's with ESA,I haven't received the preliminary findings yet, but the inspector has informed me that ESA would make this a finding.

The finding was the grounding of these fiber **metal cabinets** that are being installed within the ground grid of our pad mounted transformers,

Question: Bell Canada is aware of our Standard why would we be (Hydro Ottawa) responsible to make sure that they are grounding these cabinets according to our Standard?

I contacted Bell and they haven't been able yet to produce at least a Standard or picture to show ESA that this is being done, I have a strong feeling that Bell isn't grounding these metal cabinets, even looking inside I didn't see any ground connection on the frame or cabinet.

A. It is not a matter of ensuring the cabinets are grounded, it is a matter of did the installer damage your ground loop. If there is a concern this could happen, the LDC should follow-up with the installer of the cabinets. LDC was contacted directly.

Auditor Question

Q. 'What is ESA's view on using non-linear tables for service layouts applications for tangent pole lines? The tables are modelled by taking into account specific common scenarios and are based on worst-case circumstances

A. If the standard is P.Eng approved this meets the requirements of Regulation 22/04. The Auditor can ask if the non-linear tables meet the requirements of the 2015 version of the Overhead Systems standard or a newer version.

In addition, this standard like any standard, should have clear detail when it can be used.

Auditor Question

Q. Bulletin DB-01-19 – used equipment returned for re-use. When used equipment is returned to a vehicle for re-use; not intended to be returned to inventory, how are LDC's to document standards for re-use as requested? What conditions for re-use should be documented for a revision of the LDC's used equipment approval procedure? Please provide some examples.

A. Bulletin DB-01-19 states that for this scenario. *No documentation approving this equipment for reuse is necessary to confirm there is no undue hazard. The Distributor shall document the minimum standards for reuse and the minimum qualifications of the persons who may approve the equipment to be returned to the vehicle as part of the Distributors equipment approval process.*

Expansion on Sentence 2: ESA is looking for the LDC to approve this process and put some criteria around it. If they never want Line Staff to re-use bolts that should be stated. Also the person making the decision should be addressed (Example a Line Staff employee with at minimum 5 years experience.

Auditor Question

Q. Discuss progress on review of the Technical guidelines.

A. ESA has grouped the Technical Guidelines into a logical sequence, into 5 different years. The plan is to revise or reaffirm the Guidelines on a 5 year cycle. Staffing issues have prevented implementing the plan, however the plan is the same as it was when presented to Stakeholders in the past.

Auditor Question

Q. When an LDC does a complete rebuild of several city blocks, auditors are to ensure that partial certificates of inspection are provided. What if an auditor can find no evidence that circuits were re-energized in stages? How should this be recorded?

A. If the Auditor feels that it is unlikely to energize such a large area at once, however there is no evidence partial energization was done. ESA requests that these be reported as an Observation.

Auditor Question

Q. When planned maintenance work not required by OR 22/04 is missed (such as transformer oil testing or insulator washing), how should this be recorded?

A. ESA requests that these be reported as Observations. ESA is reviewing CSA Z463 and related standard work, whoever as of this meeting ESA is still using the OEB's DSC Appendix C to address Compliance with the Maintenance requirements of Regulation 22/04.

Auditor Question

Q. System patrol records may now be collected using hand held electronic devices. Should auditors inspect the devices to confirm the method of data collection?

A. ESA does not see the need to Audit for this. ESA would like to hear the opinion of the Auditor's today though.

Auditor Question

Q. Must electronic trouble reports created by the LDC's control room show a no undue hazards confirmation if this is the only record of repairs made or restoration of electrical service?

A. ESA's current position is that there should be a no undue hazard confirmation, or something equivalent. The LDCs have not brought this up as an issue, if they do ESA could re-evaluate this position.

The Control Room Operator shall not sign the statement of No Undue Hazard. The record is to be signed off by the person doing the work. If the CVP is approved and it meets the CVP that would override the direction in this presentation.

Focus of 2019 Audits

- CSA Clause 1.2 (ESA Bulletin – **DRAFT**)
  - ESA has OR will remove ESA bulletin DIB-03-08 entitled "CSA C22.3 Elucidation". It will be replaced with what version can be applied when LDCs are working on
    i. New Line Sections; -
    ii. Replacements;
    iii. Alterations;
    iv. Additions; or
    v. Upgrades
  - ESA has noticed that some LDCs were not aware of the changes to the Overhead and Underground standard with respect to Clause 1.2.
  - ESA has noticed that there are some LDCs that are confused on the application of ESA bulletin DIB-0-08 entitled "CSA C22.3 Elucidation".
- "Work Instructions" vs "Plans"
  - ESA has a concern that there may not be a clear delineation between "Work Instructions" and "Plans".
  - ESA has a concern regarding the use and approval of "SPIDA Calc" and "PLS Pole".
- Midspan Structures that Support only the Communication Conductors
  - C22.3 No.1 Clause 5.8.3.3 and Certificates of Deviation
- "Delta – Wye" conversions
  - Update Auditors on this project, in the event you are asked questions.

Focus of 2019 Audits

Clause 1.2

- In the Overhead and Underground Standards (the Standards) the standard points to the Authority Having Jurisdiction (AHJ) to provide direction on what version of the Standards stakeholders need to comply to when working on the overhead and underground supply systems.

- ESA has drafted a bulletin that clearly defines the requirements and provides examples.

- It addresses (i) Existing Lines (ii) New Line Sections (iii) Replacements (iv) Alterations (v) Like-for-Like Replacements (vi) Additions & (vii) Upgrades.

Focus of 2019 Audits

Clause 1.2

Go Over Bulletin

Focus of 2019 Audits

Clause 5.8.3.3

- Midspan Structures that Support only the Communication Conductors
  - States - "midspan structures that support only the communication conductors shall be avoided. To ensure adequate clearances are maintained, the supply conductors and communication facilities shall be attached to the common structure."
  - ESA expects Certificates of Deviation to be signed. UAC to be notified and if they wish to have the standard changed, they need to address the T.C.

Focus of 2019 Audits

Certificates of Approvals DB-02/19

- ESA issued a bulletin that explained how LDCs remain in compliance with Section 7.
- At the time of the signing the Engineer must have a Licence Status of “Current” with the Professional Engineers of Ontario (PEO).
- If the Engineer’s Licence Status changed due to being “Cancelled, Revoked, Suspended or Resigned” the LDC should have evidence that at the time of signing the Engineer’s status was “Current” or there could be issues demonstrating compliance with Regulation 22/04.

Update - Focus of 2018 Audits

Certificates of Deviation - Example



Proposed for C22.3 No.1-20

- Structures shall be located at least 150 mm from the edge of a curb, measured away from the travelled portion of the roadway where practical.
- Note: Where a road authority exercising jurisdiction over a structure location has issued a permit for, or otherwise approved specific locations for supporting structures, that permit or approval shall govern.

Focus of 2019 Audits

"Work Instructions" vs "Plans" – **Continued from last year**

Approval of Software for non-linear analysis work

Question #3

If the overhead design requires engineering calculations, such as guying and anchoring and therefore require the use of a non-linear analysis tool, such as SPIDA Calc. or PLS Pole, is the technician required to get the design checked and stamped/sealed by a professional engineer or can the design be checked by his immediate supervisor who is not an engineer?

Answer #3

Depends.

If a Professional Engineer signs off the use of SPIDA Calc or PLS Pole, as they would an approved standard (with a Certificate of Approval) or equivalently recognizes that the programs are harmonized with the standard, then the work can be considered a "Work Instruction" and the Certificate of Approval would be with the Professional Engineer that approved the use of the program.

Bulletins published

Bulletins

DB-01-19 Unused vs Used Distribution Equipment

DB-02-19 Certificate of Approval Requirements

DB-03-19 Electrical Equipment Near Combustible Gas Equipment

DB-04-19 Pad-mount Equipment Protection & Construction Projects

DB-05-19 Audit & DoC Due dates - 2019 Group 1

Flash Notices

FN-03-19 3-Phase, 3-Wire, Solidly-Grounded Wye Customer Services

DB-01-19 Unused vs Used Distribution Equipment

ESA DIRECTION

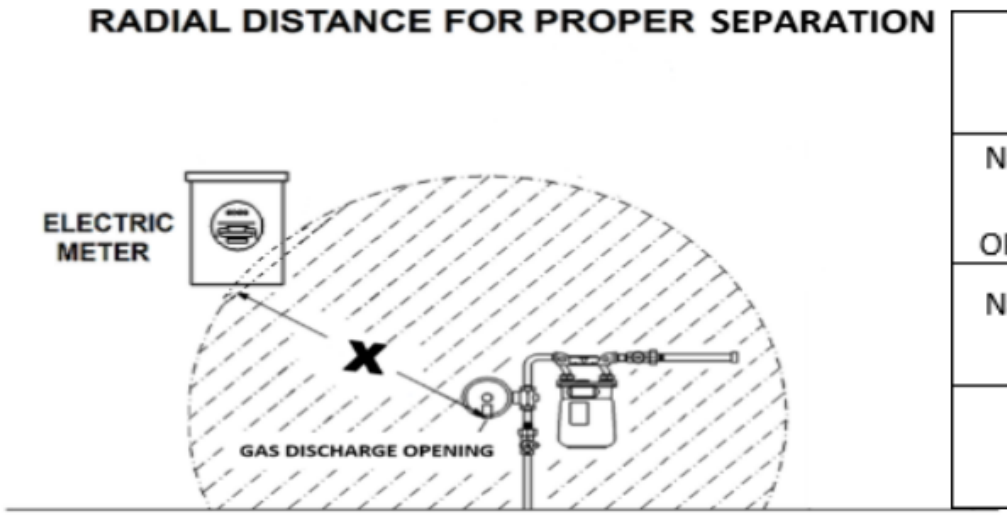
Approved electrical equipment that goes out to the field, but is not installed on the Distributor's distribution system is deemed as **unused equipment**.

Approved electrical equipment that has been installed on the Distributor's distribution system, regardless of the length of time it was installed is deemed as **used equipment**.

For **unused equipment**… no documentation of the equipment is necessary to confirm there is no undue hazard, prior to the equipment's later use within the distribution system.

For **used equipment** that is, returned to a Distributor's vehicle only (i.e. not returned to stores) or which remains onsite, a Competent or Qualified person shall determine if the equipment is acceptable to be returned to the vehicle for reuse. No documentation approving this equipment for reuse is necessary to confirm there is no undue hazard. The Distributor shall document the minimum standards for reuse and the minimum qualifications of the persons who may approve the equipment to be returned to the vehicle as part of the Distributors equipment approval process. For direction on returning used equipment to stores or other used equipment scenarios, please reference the current Technical Guidelines for Sections 6, 7 & 8.

DB-03-19 Electrical Equipment Near Combustible Gas Equipment



Fuel	Separation (x)
Natural Gas with OPSO/OPCO	0.3m
Natural Gas	0.9m
Propane	3m

DB-05-19 Audit & DoC Due dates - 2019 Group 1

- The submission date to ESA for Group One is **May 31, 2020**. The period subject to the Audit and the Declaration of Compliance will be January 1, 2019 to December 31, 2019.

- The previous was 2 months earlier (**March 31**). This is designed to allow Audits to be done in safer driving weather conditions if desired.

Other Issues

1. Configurations of Concern – On-going
2. Pad-mount Equipment Protection & Construction Projects – 2019 Bulletin
3. ESA Staffing Levels - Resolved Soon
4. DERs, Reg 22/04 Guideline - Updated
5. Tree Trimming beyond the property line of lines owned by the LDC
6. EV Chargers – DB-04-16.

Other Issues

Distributed Energy Generation

- Guideline will be updated and published on ESA's website upon final approval.
- Guideline will no longer called "Energy Storage & Generation".
- Guideline outlines what is typically deemed "part of a distribution system under Regulation 22/04"

Other Issues

Other Issues

- ESA has recently reminded LDCs that they are responsible for maintaining an adequate barrier of all their distribution lines, including secondary lines beyond the demarcation point.
- **DSB 02-09**
- Section 4(4) "**All overhead distribution lines, including secondary distribution lines**, shall meet the following safety standards…
- (3) Energized conductors and live parts shall be **barriered such that vegetation**, equipment or unauthorized persons do not come in contact with them or draw arcs under reasonably foreseeable circumstances.

LDC Mergers and Acquisitions

1. Alectra
   - Guelph Hydro license is gone.
2. Elexicon
   - Merger of Veridian and Whitby completed.
3. Synergy North
   - Merger of Kenora and Thunder Bay completed.
4. Hydro One, Peterborough, Orillia
   - In discussion
5. Wataynikaneyap Power GP Inc. on behalf of Wataynikaneyap Power LP
   - New, planned-temporary LDC

- Any Questions?