Information Bulletin:
Formal Release of Primary Guide 2017 Edition

1.0 Items Covered

Primary Guide 2017	Requirements for Customer-Owned Primary Services Supplied at 4 kV to 35 kV ("Primary Guide")

2.0 Overview

This bulletin presents the latest revisions to the BC Hydro *Requirements for Customer-Owned Primary Services* since the last edition issued in July 2010. The 2017 edition of the Primary Guide contains significant changes and improvements, and new requirements for the construction and installation of customer-owned primary services. The marked changes in this Revision 1 of this bulletin are those made since Revision 0 was released in January, 2018.

The latest changes to the Primary Guide were made in response to customer requests and changes to the primary service equipment, as well as changes to the BC Hydro distribution standards, BC Hydro planning, associated work methods and safety procedures.

The following list describes the changes in the 2017 Primary Guide:

1) Page 7: Section 1 – Interpretation. Replaces Section 1 – Overview and Section 3 – Disclaimer in the 2010 Primary Guide. Several items mentioned briefly in the "Overview" have been rewritten and substantially expanded into new paragraphs contained in Section 3 – System Requirements of the 2017 Primary Guide.

2) Page 8: Definitions – Dead Zone in Primary Switchgear. New definition added in PG 2017 R2.

~~2)~~3) Page 11: Paragraph 3.1 – Design and Compliance. New paragraph sets out the requirements for compliance with various standards and jurisdictions, as well as certification by professional engineers.

~~3)~~4) Page 11: Paragraph 3.2 - Utility Access. New paragraph specifies the BC Hydro requirement for building access and the location of the customer primary service vault.

~~4)~~5) Page 12: Paragraph 3.3 - Supply Configuration. New paragraph describes various supply configurations within the BC Hydro distribution system. Further changes made in PG 2017 R2.

~~5)~~6) Page 13: Paragraph 3.4 – Point of Connection. New paragraph explains BC Hydro's requirements consistent with the BC Electrical Code definition and Section 36 Rules.

~~6)~~7) Page 14: Paragraph 3.6 – Power Quality. New paragraph presents a summary of the utility regulations and new BC Hydro standards requirements for customer power quality and emission limits.

~~7)~~8) Page 15: Paragraph 3.7 – Customer Service Entrance Equipment (title revised from Equipment Overcurrent Protection and Coordination for Primary Services). New paragraph provides a summary of BC Hydro requirements contained in Section 10 – Primary Service Protection Requirements.

~~8)~~9) Page 17: Paragraph 3.9.1 – Open Transition Standby Generation title revised.

~~9)~~10) Page 17: Paragraph 3.9.2 – Closed Transition Standby Generation (title revised from Customer Owned Parallel Generation) and further text revisions made.

~~10)~~11) Page 18: Paragraph 3.10 – Maintenance and Testing. New paragraph explains the BC Hydro requirements with emphasis on dual radial supply customers.

~~11)~~12) Page 18: Paragraph 3.11 – Customer Application Process. New paragraph points to the new flowchart in Appendix 2, showing all steps of the application process, for more effective review and acceptance by the BC Hydro designer.

~~12)~~13) Page 20: Section 5 – Submission Procedure. Substantially revised from the 2010 edition, streamlining the application process and clearly defining each step of the application for primary service. The paragraphs have been renumbered to better correspond with the steps in the application process flowchart.

~~13)~~14) Page 23: Paragraph 5.2.3 – Site Plan. Revised paragraph containing new requirements for BC Hydro marker boards for buried cables and new cast iron warning plates for concrete-encased HV service cables.

~~14)~~15) Page 24: Paragraph 5.2.4 – Primary Service Overhead Line Construction. New paragraph sets out revised BC Hydro requirements according to the Technical Safety BC Directive and new standard PG A1-02.

~~15)~~16) Page 26: Paragraph 5.6 – Dead Front Primary Services. New paragraph according to the ES54 S3-01 standard, developed in response to the request for improved design of outdoor type kiosks and technical advancements for improved safety of customer-owned primary services.

~~16)~~17) Page 27: Paragraph 5.7 – Temporary Power as Primary Services. New paragraph provides brief BC Hydro requirements for temporary services.

~~17)~~18) Page 30: Paragraph 6.2.4 – Maximum Transformer Size and In-Rush Current Limitation. Lists the maximum values for allowed inrush currents upon energizing in Table 1. Text has been substantially revised for PG 2017 R2 and Table 1 has been deleted.

~~18)~~19) Page 32: Paragraph 7.2 – Customer Scope of Supply for Overhead Service Connections. New paragraph providing specific customer requirements in line with new Paragraph 5.2.4.

~~19)~~20) Page 33: Paragraph 7.3 – BC Hydro Supply for Underground Building Service Connection. Substantially revised paragraph listing specific requirements and design details for underground building service connections using BC Hydro owned switchgear inside customer buildings, as a form of the Open Loop Supply according to the ES54 E6-01, E6-02 and ES54 S3-03 standards. Subparagraph 2) second paragraph has been deleted in PG 2017 R2.

~~20)~~21) Page 34: Paragraph 7.4.1 – BC Hydro Supply Point Located Outside Customer Building. Lists specific requirements for building access and service duct installation according to the ES54 S3-03 standard. ES54 S3-03 also provides construction details for high flood level areas.

~~21)~~22) Page 35: Paragraph 7.4.2 – BC Hydro Supply Point Located Inside Customer Building. Lists specific requirements for building access, service duct installation and maximum distance, according to the ES54 S3-03 standard.

~~22)~~23) Page 37: Section 8 - Guidelines for Primary Service Construction. Substantially revised because the entire Section C standards for PILC and XLPE type cables have been obsoleted. All information for XLPE type cable is now contained in the ES54 S3-01, S3-02 and S3-03 standards. However, all references for PILC cables are no longer applicable for new primary service connections. In addition, new explanatory notes about cable supports, concrete encasement, single-core cables inside ferromagnetic ducts, separable insulated connectors, etc. have been added in various paragraphs.

~~23)~~24) Page 34: Paragraph 8.2.2.1 – Cable Terminations for Extruded Dielectric Supply Service Cables. New paragraph provides specific details for these service cables.

~~24)~~25) Page 34: Paragraph 8.2.2.2 – Separable Insulated Connectors for Dead Front Services. New paragraph provides specific details for dead front type services using separable terminators and connectors.

26) Page 41: Paragraph 8.3.4 – Cable Pits. Minimum length 2100 mm added; composite and steel checker plate cover types deleted in PG2017 R2.

~~25)~~27) Page 42: Paragraph 8.4.1 – Height requirements for personnel access door, 900 mm wide, and equipment door, 1200 mm wide minimum, clarified in PG 2017 R2.

~~26)~~28) Page 49: Section 10 – Primary Service Protection Requirements. Substantial revisions in content, style and format.

~~27)~~29) Several paragraphs, contained in the Primary Guide 2010, entitled “Standby Generator Operation”, “Power Line Disturbances”, “Surge/Lightning Arresters”, “Testing and Maintenance”, “Revenue Metering”, etc. have been substantially expanded, rewritten and moved into Section 3 – System Requirements.

~~28)~~30) Page 49: Paragraph 10.1.4 – Interrupting Rating and Minimum Time Margins. Substantially revised, adding Table 3 (now Table 2 in PG 2017 R2) – Minimum Separation of Protective Devices. This table was specified by the BC

Hydro Protection and Coordination Group for the exact time margins for the customer service main as the number of cycles required clearing the fault. Table 2 is now Table 1 in PG2017 R2. Past BC Hydro history reference paragraphs after previous Table 3 have been deleted.

Also, the original PG D1-01 standard has been revised to provide a more accurate illustration of protection coordination between the BC Hydro and the customer protective relays. PG D1-01.01 now illustrates more accurately the fuse coordination graphs for T-type fuse curves contained in the revised PG D2-01 standard. Similarly, relay type over-current protection for large primary customer loads is shown in PG D1-01.02. It is important to note that large customers shall coordinate with BC Hydro switchgear or recloser relays as determined by a feeder planner.

31) Page 50: Paragraph 10.2.1 – Current Transformers. Significant revisions to all paragraphs describing CTs, relays and circuit breakers, including draw-out type circuit breakers and reclosers as acceptable devices. Consequently, PG A1-01 has been revised and new standard PG A1-02 developed to show different service connection configurations.
Minor clarification regarding "dead zone" definition added in PG 2017 R2.

32) Page 51: Paragraph 10.2.3 – Circuit Breakers. Contact opening time of not more than two cycles replaced with maximum interrupting time of not more than five cycles.

~~29)~~33) Page 52: Paragraph 10.3.1 – Fuse Size. Minor clarification pointing out that the customer shall consult the BC Hydro designer regarding the BC Hydro upstream protective device details.

~~30)~~34) Page 65: Appendix 2 – Reference Documents and Standards. Completely new appendix added containing several Technical Safety BC documents, BC Hydro agreements, many new distribution standards, signage, etc.

~~31)~~35) BC Safety Authority name changed to Technical Safety BC. All documents identified as BC Safety Authority shall be read as Technical Safety BC.

~~32)~~36) Technical Safety BC Directive D-EL 2017-01 Exemptions to Utilities has been added (page 76) and Information Bulletin IB-EL 2017-04 Electrical Safety Regulation Application to Public Utilities (page 78).

~~33)~~37) Page 134: Appendix 3 – List of Photographs. Expanded new appendix containing additional photographs showing O/H line construction, revenue metering compartment, customer fuse section and dead front type primary service switchgear.

38) Page 150: Picture 5 and Picture 6 titles reversed in PG 2017 R2.

The following list describes what has been revised in Primary Guide 2017:

1) Page 8: Section 2 – Definitions. This has been moved to the front, as with the format of the majority of similar engineering standards. There are several minor revisions to the original definitions.

2) Page 13: Paragraph 3.5 – Revenue Metering. This is the original paragraph 10.8 in Primary Guide 2010, which has been moved to Section 3, rewritten and expanded significantly.

3) Page 16: Paragraph 3.8 – Primary Service Voltage Conversion Requirements and Procedure. This is the revised paragraph 5.5 from Primary Guide 2010 with minor additions to the procedure.

4) Page 16: Paragraph 3.9 – Customer-Owned Generation. This is the revised paragraph 10.4 from Primary Guide 2010 with significant clarifications regarding the installation and acceptance of large customer-owned open transition standby generators.

5) Page 19: Section 4 – Standards and Regulations. This is a condensed version of "Section 2" in Primary Guide 2010, with several reference standards removed as less relevant or redundant.

6) Page 20: Paragraph 5.1 – Preliminary Design. This revised paragraph presents a separate listing of the Customer Submissions and BC Hydro Response.

7) Page 28: Section 6 – BC Hydro Primary Distribution System. This is substantially the same, with the addition of new paragraph 6.2.4 – Maximum Transformer Size and In-Rush Current Limitation, listing the maximum values for allowed inrush currents upon energizing in Table 1.

8) Page 45: Section 9 – Primary Service Switchboard Construction. No major changes from Primary Guide 2010. Minor references added for additional types of acceptable grounding studs, viewing window requirements for dead front type switchgear, etc.

9) Page 53: Appendix 1 – List of Distribution Standards. Contains fewer standards and reference documents. In particular, all Section B and Section C standards have been obsoleted.

3.0 Action

The effective date for the new edition of the Primary Guide 2017 Revision 2 is July 1 ~~April~~ 2018.

All new applications for primary service connections, after the effective date of July 1 ~~April~~ 2018, shall meet the BC Hydro requirements contained in Primary Guide 2017.

For approved projects or pending design and construction of new customer-owned primary service installations already in progress, scheduled for completion before July 1, 2018, the customer may comply with the requirements of the Primary Guide 2010 edition. Alternatively, the customer, in agreement with the BC Hydro designer, could opt for compliance with the new edition of the Primary Guide 2017 Revision 2. ~~contact BC Hydro Distribution Standards for further direction.~~

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5.0 Approval

Recommended		Reviewed		Approved	
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Date:	2018-03-07	Date:	2018-03-07	Date:	2018-03-07