

March 31, 2011

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SUBJECT 2745

OUTLINE OF INVESTIGATION

FOR

METER SOCKET ADAPTERS FOR COMMUNICATIONS EQUIPMENT

Issue No. 1

March 31, 2011

Summary of Topics

This is the first issue of the Outline of Investigation for Meter Socket Adapters for Communications Equipment, Subject 2745, which covers wireline and wireless communications devices, or power supplies powering such devices, installed in a meter socket adapter. These devices are associated with network communications equipment powered at the premises and may be associated with smart grid applications.

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INTRODUCTION

1 Scope

1.1 These requirements cover wireline and wireless communications equipment, or power supplies powering such equipment, installed in a meter socket adapter. These devices are associated with network communications equipment powered at the premises and may be associated with smart grid applications. These devices may be connected on the line side of the service disconnect in accordance with the National Electrical Code, NFPA 70-2011, Section 230.82(9).

1.2 Equipment covered by this Outline of Investigation may be provided with one- or two-way communication, by means of power line carrier signals, telephone, cable, wireless communication, or other methods. Equipment covered by this Outline of Investigation may be provided with one- or two-way communication, by means of power line carrier signals, telephone, cable, wireless communication, or other methods.

1.3 This equipment may additionally provide signals for the control of electrical loads or electrical power generation equipment in response to signals received from the utility or local communication networks. This equipment does not provide metering of utility power for the purpose of revenue billing.

1.4 These requirements cover socket mounted equipment, intended for installation in ordinary (non-classified) locations installed in-between the electric meter and the meter socket.

1.5 This Outline of Investigation does not cover the following:

- a) Meter socket adapters that do not incorporate communications or communications powering equipment. Such devices are covered by the Standard for Meter Sockets, UL 414.
- b) Electric utility meters which measure, monitor, record, transmit, or receive electrical energy generation or consumption information. These devices are covered by the Outline of Investigation for Electric Utility Meters, Subject 2735.
- c) Communications equipment that may be powered from, or communicate with, this equipment that is not installed in a meter socket adapter.

2 Units of Measurement

2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

3 Undated References

3.1 Any undated reference to a code or standard appearing in the requirements of this Outline of Investigation shall be interpreted as referring to the latest edition of that code or standard.

4 Glossary

4.1 For the purpose of this Outline of Investigation the following definitions apply.

Note: When applying clauses from the Standard for Information Technology Equipment – Safety – Part 1: General Requirements, UL 60950-1, as required elsewhere in this document, the terms and definitions in Section 1.2 of UL 60950-1 are applicable.

4.2 **INTERCONNECTION CIRCUIT** – An isolated secondary power, communications or signaling circuit intended to be electrically connected to other equipment, to an accessory or parts of the equipment external to the main enclosure or to a telecommunications network or to a cable distribution system. A connector located internal to the enclosure is considered an interconnection circuit if it is intended to connect to external equipment. This includes set-up or test equipment connected on a temporary basis.

4.3 **LIMITED CURRENT CIRCUIT** – A circuit as described in Clause 1.2.8.9 of the Standard for Information Technology Equipment – Safety – Part 1: General Requirements, UL 60950-1 that meets the requirements in UL 60950-1 for Limited Circuit Currents.

4.4 **LIMITED POWER SOURCE** – A power source that meets the requirements for limited power sources as described in Section 2.5 of the Standard for Information Technology Equipment – Safety – Part 1: General Requirements, UL 60950-1.

4.5 **METER SOCKET ADAPTER** – A device intended to act as an interface between a meter and a meter socket. Meter socket adapters are designed to plug into a meter socket and to accept a plug in meter.

4.6 **SELV CIRCUIT** – A Safety Extra Low Voltage (SELV) Circuit as described in Clause 1.2.8.8 of the Standard for Information Technology Equipment – Safety – Part 1: General Requirements, UL 60950-1 and meets the requirements in UL 60950-1 for SELV circuits.

4.7 **TNV CIRCUITS** – A TNV-1 circuit, TNV-2 circuit or TNV-3 circuit as described in Clause 1.2.8.11 of the Standard for Information Technology Equipment – Safety – Part 1: General Requirements, UL 60950-1 and meets the requirements in UL 60950-1 for TNV Circuits.

CONSTRUCTION

5 Components

5.1 In addition to complying with the requirements in this Outline of Investigation, and other than as indicated in 5.2, a component of a product covered by this Outline of Investigation shall comply with the requirements for that component. See Appendix A for a list of standards covering components used in the products covered by this Outline of Investigation.

5.2 A component is not required to comply with a specific component requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this Outline of Investigation or
- b) Is superseded by a requirement in this Outline of Investigation.

5.3 A component shall be used in accordance with its rating established for the intended conditions of use.

5.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

6 Meter Socket Adapter

6.1 The portion(s) of the equipment that interface(s) with a meter socket or an electric meter shall comply with the Standard for Meter Sockets, UL 414, including Supplement SA – Meter Socket Adapters.

7 Enclosures

7.1 General

7.1.1 A meter socket adapter enclosure shall comply with the requirements for the Standard for Meter Sockets, UL 414 and with the requirements in 7.1.2 or 7.1.3 as applicable. Circuits that are not located within the meter socket adapter enclosure shall be provided with an enclosure that complies with the Standard for Information Technology Equipment – Safety – Part 1: General Requirements, UL 60950-1 and the Standard for Information Technology Equipment – Safety – Part 22: Equipment to be Installed Outdoors, UL 60950-22, as applicable.

7.1.2 The enclosure of a device intended for use indoors shall comply with the performance requirements of the Standard for Electrical Equipment, Environmental Considerations, UL 50E, for Type 2 enclosures

7.1.3 The enclosure of equipment intended for use outdoors shall comply with the performance requirements of the Standard for Electrical Equipment, Environmental Considerations, UL 50E, for Type 3R enclosures. If any water enters the enclosure as a result of the rain test, the requirements for drainage openings in Paragraph 7.3.3 of UL 50E shall also apply

7.2 Nonmetallic enclosures

7.2.1 A nonmetallic enclosure shall comply with the applicable mechanical/electrical property considerations, flammability, moisture-absorptive properties and thermal requirements for fixed and stationary equipment as specified in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C. When applying this requirement, equipment containing communications circuits or other metallic members originating in network outside plant facilities requires an “enclosure”.

7.3 Covers

7.3.1 A part of an enclosure such as a door or cover shall be provided with means for firmly securing it in place.

7.3.2 An enclosure cover shall be hinged:

- a) If it gives access to a fuse or other overcurrent device, the functioning of which requires renewal;

Exception: A hinged cover is not required if the only overload-protective devices enclosed are:

- 1) Supplementary fuses in control circuits, provided the devices and circuit loads are within the same enclosure or*
- 2) Extractor fuses having an integral enclosure.*

- b) If it is necessary to open the cover in connection with normal operation of the device

- c) If it gives access to communications or power supply circuits that contain service ports (Ethernet, USB, SD slots, etc.), configuration mechanisms (DIP switches, etc.) or reset switches.

8 Internal Wiring and Connections

8.1 The internal wiring shall consist of general use wire or appliance wiring material acceptable for the particular application when considered with respect to the temperature and voltage and conditions of service to which the wiring is likely to be subjected.

8.2 Primary circuit wiring and any wiring insulation required to maintain double or reinforced insulation between primary and secondary circuits shall be rated minimum 130°C.

Exception: For equipment intended only for installation indoors and clearly marked in accordance with 25.2, the wire may be rated 105°C minimum. If the equipment specifications include a maximum operating temperature (maximum temperature or high end of a specified temperature range) then the minimum wire temperature rating shall be the maximum specified temperature (°C) + 65°C but not less than 105°C.

8.3 Line voltage wiring that does not conduct the main current for the meter circuit (that is not connected in series with the meter base jaws and meter blades) shall be no smaller than 18 AWG. Conductors of sizes 18 AWG and 16 AWG shall be permitted to be used, provided they supply loads that do not exceed the ampacities given in the National Electrical Code, NFPA 70, Section 402.5 and do not exit the meter collar enclosure. Conductors larger than 16 AWG shall not supply loads greater than the ampacities given in NFPA 70, Section 310.15. Overcurrent protection for conductors shall be provided in accordance with the conductor ampacity described in NFPA 70, Section 240.4(D). It is permitted for the overcurrent protection to be at the termination of the conductors provided the conductors are less than 12 inches long