

Research Study:

Aging Utility Meter Assembly (UMA)



Background

The Electrical Safety Authority (ESA) conducted a research study in 2017 with the purpose of determining the safety risk of A Base UMAs with an S Adaptor.

The research was conducted with the purpose of determining the safety risk of A Base UMAs with an S Adaptor. Adverse outcomes were reported for A Base Utility Meter Assemblies (UMAs) with an S Adaptor. For example, In Collingwood, there was a case where the brick facing kept the damage to minimal. The extra component (S Adaptor), the 12 terminations, as well as age increase risk.

Scope of Study

Tests and observations were done to determine the structural, mechanical and electrical integrity. Thirty homes with A Base UMAs and S Adaptor were sampled; this included the meter assembly components, S adaptor, meter base and raceways.

(Out of Scope – Electrical system of the home outside what is described above and the physical appearance of the UMAs that are not safety related.)

Tests and observations

The study followed NETA protocol, OESC, and best industry practices. This included:

- Visual and Infra Red Imaging (energized)
- Conductive and Insulation resistive tests

- Tightness of terminations (@ 60%, 80%, 100%)
- Gap Indicator Test (Push blade test)

A Licensed Electrical Contractor (LEC) was contracted to perform observations and testing. ESA staff were engaged for technical support and recording.

Field work started in September 2017; it was suspended for the winter of 2018; and completed in late July 2018. Analysis was completed in September 2018.

Findings & Observations

Visual observation did not find signs of arcing, resistive heating, water damage, contamination, or fire. There were the beginning signs of rust in some terminations, but they still can be tightened.

All samples were within established tolerance for

- IRI
- Conductive and Insulation Resistive tests (one S Adaptor's insulation value showed lower value but still within tolerance)
- Gap Indicator

All samples as a unit failed the torque test.

- Customer owned terminations (bottom row) had highest failure rate
- Samples with largest power consumption had 25% pass rate compared to 47% for samples with lower power consumption
- Some damage on the head of termination

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Key Conclusions

- Cable's condition was within established tolerance.
- Terminations and possibly S Adaptors are points of concern.

Recommendations

- Advise utilities to have terminations tightened when servicing meters.
- Conduct further study on S Adaptors
- Conduct a more specific study with larger size on UMAs with higher load cycle

These findings were presented to ESA's Utility Advisory Council (UAC).