Leakage Current Tests of Equipment Used for CECB Calibration

When I was calibrating an Apex DT502 signal strength bar with an SLM I noticed a slight shock when I touched ground and the equipment case. Because I didn't want to use, or pass on, dangerous equipment I decided to test the equipment that I was using for the calibration. The measurements were made with my Simpson 229 Leakage Current Tester:
Apex #1 22VAC, 52μA (microamperes)
Apex #4 21VAC, 50μA
Apex #1 & #4 together 30VAC, 100μA (note that the leakage currents add)
2 Audiovox PLV16081 8" TV/Monitors 21VAC, 24μA each
CM7777 power supply, plug inserted correctly ~ 1VAC, ~ 1μA or
CM7777 power supply, plug inserted reversed 14VAC, 33μA
Sony KDL-22L5000 TV 24VAC, 52μA
Sadelco 719E SLM with AC Adapter/Charger ~ 1μA
RS preamp with AC Adapter ~ 1μA

Leakage current tests must be made under 4 conditions: power on and off with plug normal, power on and off with plug reversed. With the exception of the CM7777 power supply, all equipment gave the same reading under the 4 conditions. The 7777 power supply has a 3.3Meg resistor from ground to one side of the line, presumably to drain static charge from the coax shield, which explains the difference in leakage current readings.

The Apex boxes and the 8" TVs have switch mode power supplies which explains the higher leakage currents. The AC adapters for the Sadelco SLM and the RS preamp use a transformer type AC adapter which has good isolation from the AC line.

CONCLUSIONS:
All pieces of equipment tested are safe to use individually as per the guidelines in the Simpson manual and attachments. However, when other equipment is connected, the leakage currents add as demonstrated by connecting the two Apex boxes together. This means that when pieces of equipment that have 2-wire power cords are connected together, even when the polarized plugs are correctly inserted, it is advisable to ground the cabinets and coax. Before I grounded the interconnected equipment that I was using, the AC voltage to ground was 40 volts, and the total measured leakage current was about 200 μA.

I originally bought the Simpson tester because of three close calls. One was because of my carelessness, the other two were because of the stupidity of others.

Many years ago a neighbor asked me to help him connect his new TV. He was having trouble because the polarized 2-wire plug wouldn't go into the AC receptacle, so he filed down the wider prong (neutral). I asked him why he hadn't just turned the plug around so that the wider prong would go into the longer slot. He looked at the outlet, looked at the plug, and then looked at me and said: "Oh."

Best regards,
Rabbit

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