**Headline: Testing Swimming Pools Can Save Lives**

*Dallas, TX – November 10, 2009* -- In Orange, Texas in 1991 a father drowned in a motel swimming pool after saving his three children who were screaming that they were being shocked. A second man, a cook at the motel, tried to save the father but he too was paralyzed by electricity and drowned.

The investigation determined that a wiring mistake had applied live current to a ground wire connected to the cover of one of the pool's underwater light. The children were far enough from the light that they received minor shocks. The two men swam close enough to the light to receive greater shocks and couldn't swim away.

There have been many such instances that brought into question electrical safety in and around public swimming pools. Then, in 1996 in New Jersey a life guard at an apartment complex was electrocuted by high voltage in the pool water.

Victor V. Timpanaro a member of the New Jersey Division of Consumer Affairs, State Board of Examiners of Electrical Contractors decided to formulate an ordinance for the testing and certification of existing community and public pools.

It was a two fold law. The first part provides an annual visual inspection of any pool wiring in the pool equipment room to determine whether any violations of the current electrical code is present which could contribute to a hazard to those using the pool.

Second, it requires a testing company to test all non-electric, metal parts of the pool and other metal appurtenances within 5 ft. of the pool in accordance with the NEC.

In 1998, the law was passed in New Jersey and compliance to the law is required before a pool can be opened for use or occupied by any person.

Testing is performed in two stages each requiring their own documentation:

1/ An annual electrical inspection is conducted by a local inspector who issues an Electrical Certificate of Compliance.

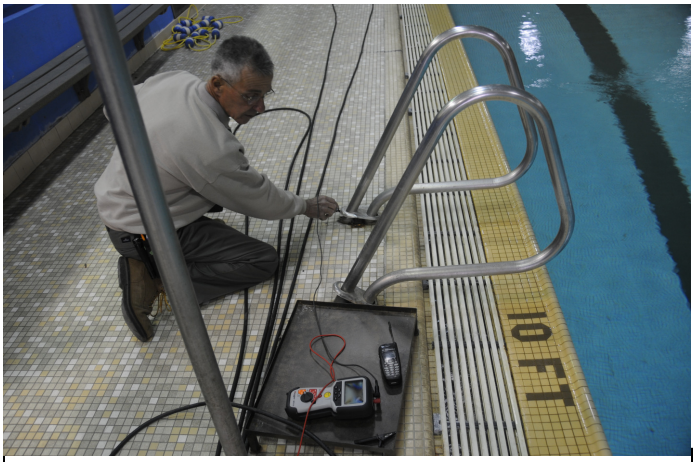
2/ The Bonding and Grounding Certificate verifies the electrical continuity and integrity of the bonding and grounding system of the pool. It is issued by a recognized electrical testing agency or a licensed electrical contractor and is valid for five years. The Bonding and Grounding Certificate is a prerequisite for the Electrical Certificate of Compliance

If testing reveals any defective electrical condition on the pool premises, that condition must be repaired by an electrical contractor licensed in the State of New Jersey prior to issuance of the Electrical Certificate of Compliance

**The Bond Test:**

Megger's MIT420 Insulation Resistance and Continuity Tester has been the instrument of choice of Lou Iaconelli. He has successfully performed tests at over 140 locations both commercially and residential pools in over 10 years and is a member of IAEI. Lou has also taught the National Electrical Code.

Iaconelli selected the MIT420 because it has memory recall and the necessary minimum output of 20mA. An excessive applied voltage would flash across any bad bond and indicate a failed bond was viable. A standard Digital Multimeter is unsuitable because you don't get the output to offset the effects of any DC voltage present in the pool water. Earth Ground Resistance of 25 Ω or less is not meant to be an acceptable value for this test as spelled out in the regulation. The acceptable level for most pools is .5 Ω or less. It might be acceptable as high as 2 Ω based on the geometry of the pool.



Lou Iaconelli tests a ladder using the Megger MIT420

Continuity tests are preformed only on the equipment ground and not the grounding electrode system. Depending on the AC output, there may be problems if the voltage of a typical ground resistance tester is too high especially if the bonds are

oxidized or if there is a loose connection you could flash across a bond instead.

To perform the test, have on hand two rolls of #8 wire, one 175 ft and the other 250 ft. Which roll to use depends on the distance to longest test point. The Megger MIT420 is connected to each end of the roll of wire and its null feature is used to zero out the test lead resistance.

Determine the location of a good reference point to connect the test leads.

If there is underwater lighting, connect to a point at the underwater pool lighting deck box. The Equipment Grounding conductor should be disconnected and the negative lead for the Megger tester connected to it as a reference point. Connect the instrument's other lead to a long pole with a probe at the end which makes contact with the bonding screw at each underwater light fixture.

Iaconelli and Art Todd check the reports generated by the Megger MIT420

For pools without underwater lighting, the referenced test point is the pump with a disconnected bonding conductor. Connect the MIT420 in the same way to this point and use the other test lead to make contact at various test points.

Test every non-electric, metallic bonding point on all amenities that are connected within 5 feet of the pool area. This will include drains, skimmers, gratings, ladders, slides, diving boards/stands, railings, fencing, handicap lift chairs and ramp railings.

**The Ground Test:**

Next, perform a ground test from the service panel to the circulation pumps frame, filter, heater, motor starters, junction boxes, switches and piping.

Evaluate and record what the resulting resistance is in accordance with IEEE standard of a maximum value of 1 Ω between metallic surfaces which represents the maximum

value allowed. Generally, the results are less than .5 Ω. The Megger MIT420 will store the resistance at each test point and clearly identify each result. Recall the test results and the associated test number the instrument assigns. Transfer this data to the customer report.

**The Voltage Gradient Test:**

Tests for spurious voltages in the pool water are conducted using a Voltage Gradient Test Probe since damaged underwater fixtures or improperly wired branch circuits provide the highest potential for human exposure.

**Conclusion:**

While New Jersey has been enforcing this law since February 1999, it is our hope that more attention be given within other States.

The bonding and grounding instrumental testing of public swimming pools, spas and hot tubs may someday become a national concern. The State of New Jersey has taken the necessary steps by mandating it as an important matter of public safety.