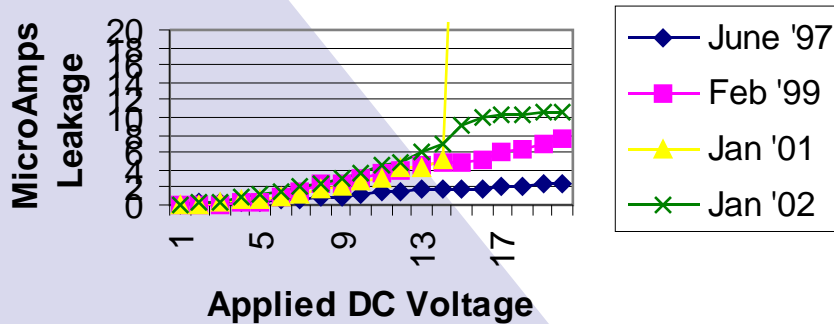


The Station Predictive Maintenance program at Limerick routinely performs electrical testing of large motors at a 2 year frequency. This testing consists of winding resistance, insulation resistance, PI Capacitance/dissipation factor and DC step voltage test to 20kV. This data has been tracked and trended for almost twenty years. On a few occasions during 2002, Operations personnel reported that an "acid" odor was present at the 1C Circulating Water Pump Motor. The PdM group had been tracking this motor on the "watch" list due to an increasing trend in

leakage current from the DC step voltage testing from 1997 to 2002 (see graph). As part of increased troubleshooting, the PdM team monitored the motor thru the summer of 2002, utilizing acoustic monitoring, vibration and winding temperature/RTD monitoring at a monthly frequency. In September of 2002, an action request was generated to replace the motor in the winter based upon the electrical testing results, increasing vibration at stator slot frequencies and higher acoustic/ultrasonic "noise".

The oversight of the motor shop repairs, once removed showed high leakage current on the "A" phase motor winding compared to the other two windings. After cleaning a

1C Circ Motor Electrical Testing



visual inspection of the winding identified partial discharge at the junction where the core slot winding tap transitions to the end winding/knuckle tape (see photo) Investigation revealed a lack of "proper" corona suppression tape at this critical junction point in the winding.

One lesson learned from this event includes the fact that tracking and trending leakage current versus applied voltage on a DC step voltage test, as presented by the AWA offline tester can and does indicate potential problems in the winding. And when this data is combined with other predictive technologies, will allow for proactive replacement of a motor prior to an in-service failure.

Harry Smith is a Component and Technology Specialist with the Limerick Generating Station, Exelon Nuclear in Pottstown, PA.

