CLAIMS

1. A method for monitoring a circuit under load using a circuit breaker comprising:

a) establishing a baseline over time for the circuit based on angular displacements in a sine curve based on voltage and current for the circuit in a vicinity of a zero crossing point of the sine curve, ~~and~~ a power factor, impedance, capacitance, and inductive reactance, the baseline based on a period at the time of monitoring and the period at a start time;

b) repeatedly monitoring a functioning in-service circuit over a period of time in the vicinity of the zero crossing point for a sine curve of the in-service circuit using the angular displacements, power factor, impedance, capacitance, and inductive reactance used in step (a) for the load of the in-service circuit; and

c) comparing the baseline of step (a) to information from step (b) to determine a degradation for the functioning in-service circuit and a decay curve, the decay curve providing an indication of a deterioration of the circuit, the decay curve providing a guide for generating an alarm and/or rendering the circuit inoperable.

2. The method of claim 1, wherein the alarm is an audible alarm and/or a visual display.

3. The method of claim 1, wherein the alarm is a communication, either wireless or hard wired.

4. The method of claim 1, wherein the circuit is made inoperable based on the deterioration.

5. An apparatus for practicing the method of claim 1, comprising

a) a circuit breaker for monitoring a load on an electrical circuit,

b) a control module spliced into the electrical circuit, the control module ~~including~~ configured to be equipped with information on the baseline and configured for the monitoring and comparing steps (b) and (c) for determining a deterioration in the electrical circuit.

6. The apparatus of claim 5 including an alarm capability when deterioration in the electrical circuit is determined~~.~~, the alarm capability including one or more of an audible alarm, a visual display, and a communication, either wirelessly transmitted or hard wire transmitted.

7. The apparatus of claim 5, wherein the control module is configured to trip the circuit breaker based on a determination of deterioration of the electrical circuit.