CLAIMS:

1. A method of predicting a life cycle of a DC circuit comprising:
   a) generating a DC pulse train for a DC circuit, the DC circuit identified to have a life cycle thereof predicted;
   b) establishing a baseline for the DC circuit in terms of amplitude ratio distortions, period ratio fluctuations, duration ratio variations characteristics at a zero crossing point of the generated DC pulse train;
   c) monitoring and determining the corresponding ratios of the DC circuit used in step (a), in a zero point crossing region for the DC circuit that has been in service; and
   d) comparing corresponding ratios of step (a) and step (b) to establish a decay rate analytic curve so that decay rate analytics can be used to establish end of life expectancy and predict estimated time to failure for the DC circuit being monitored.

2. The method of claim 1, such that the DC circuit is stand alone or part of a network of DC circuits within a system.

3. The method of claim 1, wherein for step (d), the decay rate analytic curve indicates a degradation rate of the DC circuit under analysis, and life expectancy of the DC circuit before failure.

4. The method 1 wherein data obtained from step (c) can be utilized to troubleshoot a DC circuit after complete failure.

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

   a) DC power source, if required, to generate required power;

   b) a pulse generator to generate a pulse train;

c) a pulse invertor to generate a negative pulse train;

d) a central processing unit to generate a pulse wave specific to the DC circuit being monitored;

e) a memory module for storing pulse waves until the pulse waves are transmitted back to the central processing unit; and

f) means for determining ratios and generating an algorithm to produce a decay rate analytical curve, the decay rate analytical curve used to establish end of life expectancy of the DC circuit being monitored for life cycle prediction.