PD-related stresses in the bulk dielectric and their evaluation

The application of electromagnetic field theory to the subject of partial discharges shows that discharging in a void generates large field distortions within the bulk dielectric in the proximity of the void. Such inherent over-stressing of a dielectric could be the effect which triggers the onset of electrical treeing and other damaging processes, and which subsequently precipitates the breakdown of the insulation. If there were a train of partial discharge events per power frequency cycle, then, during each half period, these events would lead to cumulative stress levels within the solid dielectric.