The Effect of Beam Excitation on the HERA Electron Beam Lifetime Disruption, D.R.C. KELLY, DESY - The electron beam of HERA is subject to disruptions of the beam lifetime. The prevailing conjecture is that this is due to dust particles trapped by the beam within quadrupoles magnets. Good lifetime can be recovered by beam excitation. This has been predicted by theory and simulation and was confirmed by experiment for HERA and PETRA electron beams. During HERA electron machine studies in Dec 1995 the lifetime was increased from 2 h to 9 h with an injection kicker at a kick rate of 10 Hz over a period of 10 minutes at energy 27 GeV and at current >30 mA. Similarly, the lifetime was improved from 3 h to 7.5 h with a high-frequency feedback kicker sweeping from frequencies near or above the beam tunes f_x ª 10 kHz, f_y ª 15 kHz to low frequencies ª 100 Hz at a sweep period of ª200 ms. The local discrete decrease of electron loss rates in loss monitors located near arc quadrupoles and of global loss rates in background and electron detectors at experiments H1 and ZEUS correlated with discrete beam lifetime improvements during the beam excitation procedures - providing further support for the trapped dust particle explanation of the HERA electron beam lifetime problem. The frequency of all loss monitor and detector events was greatly reduced during the excitation procedures. Further lifetime disruptions were however observed to recur after the excitation "cleaning" procedures were performed, especially at desired operation currents >20 mA. The kicking procedure, loss rate observations, and agreement with theory are presented.