

## Project Summary:

### Failure Analysis and Life Testing of Projection Lamps

A major avionics company asked DfR to perform life testing and failure analysis for functional and failed projection lamp assemblies. Upon analysis of the failed bulbs, DfR found that there was a misalignment of the electrodes within the bulb, which likely contributed to the premature failure. Some other failures found were melting spots on the glass, blackening, burning, and broken pieces. Life testing indicated vaporization and burning out of the cathode electrode, as well as melting of the anode, deposited metallic growth, and hot spots within the bulb. Recommended actions included screening out misaligned electrodes, discontinuing use of insulating silicone, and adding a fan to the lamp cabinet to facilitate cooling.

Keywords: bulb orientation, horizontal, vertical, electrode misalignment, overheating, failure, glass crack, cooling fan, continuous operation, power cycling, life span, melted, distorted, destroyed, burned, bent, white powder, arcing, nickel plates, ribbon seal, insulating material, thermography, asymmetrical heating, solid state relays, SSR, mercury-xenon