

2008 MORT ANTLER LECTURE

Interplay Between Electromechanical and Solid State Switching Technologies for Meeting Cost, Sustainability, and Safety Demands of Various Applications

Thomas J. Schoepf

For decades both electromechanical and solid state switching devices have been discussed in the context of competing against each other. Solid state technology certainly has had tremendous growth and use in telecommunications circuits and repetitive high endurance applications such as automotive distributors. Today even after many years of solid state development and product evolution many electromechanical devices still dominate high volume applications such as automotive and industrial relays and residential switches.

The question is what has driven the success of each of these technologies for the current markets and what are the trends in the evolution of these technologies. Both technologies have different switching characteristics, circuit effects, and failure modes, which limit their service life. Hence, they should be treated like hammer and pliers. Do we want to raise the questions as to which of both tools or which of both switching devices is better? In general terms these questions cannot be answered; we will, however, mostly find a clear answer for specific cases.

In reality, solid-state devices have enabled more new sophisticated systems and functionalities, which before were not possible. Both technologies, electromechanical and solid-state, should be seen as complementing each other rather than as competitors. Using these technologies correctly, including hybrids, will improve issues concerning sustainability, reliability, and safety.

The lecture will discuss the core strengths and weaknesses of both technologies in typical present day applications and will point to expected trends in these usages. The discussion will also include opportunities for use of hybrid devices to meet new global challenges for the issues mentioned above.