

PREVIEW

TECHNICAL EYE OPENER WORKSHOP

A DISCUSSION OF POWER RELATED PROBLEMS
IN CATV SYSTEMS

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Society of Cable Television Engineers

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Robert Bilodeau
Suburban Cablevision
East Orange, N.J.

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Travis Nabors
Columbus TV Cable
Columbus, Miss.

Panelists

Dr. Jacob Shekel
Jerrold Electronics
Horsham, Pa.

Norman Everhart
Jerrold Electronics
Horsham, Pa.

James Herman
Jerrold Electronics
Horsham, Pa.

Harry Perlow
Suffolk Cablevision
Central Islip, N.Y.

Dr. Jacob Shekel and James Herman

A well-designed coaxial transmission system is presumably enclosed and protected from any outside influence; however, every cable operator has experienced system and equipment failures due to external sources such as power line surges and lightning storms.

This paper proposes the explanation that any external cause must first generate longitudinal sheath currents (LSC) along the cable, which in turn induce voltages between the inner and outer conductors of the cable. Simple network models are developed to show how the LSC are generated, and to compute the magnitude of the induced voltages.

The model shows that system components may be subjected to excessive voltages not only during extraordinary circumstances (storms or power surges), but even during normal, day to day, steady state operation.

The theory is supported by controlled laboratory simulation, and by measurements of LSC and resultant voltages on live CATV systems. Various failures reported from the field are explained by the model. The paper also discusses the effects of system grounds on the magnitude of the LSC's, and whether the regular grounding practices can be expected to provide adequate protection against the generation of LSC's and their effects.

Norman Everhart

The paper explores the advantages and disadvantages of various protection devices which are used in CATV systems. It then discusses the inter-related effects of other components related to system reliability, such as time-delay relays, stand-by power supplies, and system grounds.

A new revolutionary circuit for protection of CATV amplifiers is described. The operation and advantages of this circuit are analyzed by system modeling, and supported by laboratory simulation and experimental use in the field.