



Future Truck Program Position Paper: 2004-1

Future Systems for Protection of Electronics Subsystems Against Lightning Effects

Developed by the Technology & Maintenance Council's (TMC)
Future Electrical/Electronics Task Force

ABSTRACT

Future truck electrical/electronic systems will encompass batteries, electronics and communication systems. Today, many electronic controllers used with components such as engines, antilock brakes, transmissions, dash instrumentation and fleet-added components (such as satellite transceivers, computers, fax and printers) are permanently damaged by effects of close and direct lightning strikes. The trucking industry has identified the need for further enhancements resulting in improved product performance, maintenance and safety, while meeting the increased demand for added protection against damage caused by lightning strikes. Any improvements made should not adversely affect, and must be compatible with, other systems components. This TMC Future Truck Program Position Paper describes the needs of fleets with respect to future electrical/electronic systems during the next 5-10 years time frame. It does not provide, nor recommend, specific solutions to satisfy stated expectations. Rather, it provides manufacturers an opportunity to develop and manufacture products for the North American trucking industry that meet certain fleet-driven expectations.

INTRODUCTION

This position paper covers three system aspects:

- Performance requirements
- Maintenance requirements
- Operation requirements

I. PERFORMANCE REQUIREMENTS

A. Total Protection Against Lightning Strikes

The trucking industry expresses the need for total protection against lightning strikes to their vehicles. Future lightning protection systems should perform during all vehicle modes of

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operation, such as engine running, engine off, and accessory switches on/off.

II. MAINTENANCE REQUIREMENTS

A. Performance/Diagnostics Intelligence

Future lightning protection systems should provide onboard diagnostics and warning capabilities, including the current operational integrity of the lightning protection system.

B. Parts Availability

Future lightning protection system parts should be available at the same or better service level as compared with today's non-protected systems.

C. Service

Future lightning protection systems should provide fleets with total protection against effects of lightning or other high-voltage external sources.

D. Training and Service Tools

The trucking industry requires enhanced and standardized training tools and methods that are easy to understand and follow. The ser-

vice tools should be designed to work with the truck communication systems and comply with appropriate TMC standards.

E. Diagnostics

Future lightning protection systems should have enhanced onboard diagnostic and warning capabilities that apply to individual parts and components. These systems should be compatible with the TMC standards for onboard/off board communications systems.

III. OPERATIONAL REQUIREMENTS

A. Cost of Ownership

Future lightning protection systems need to improve fleet cost of ownership over the life of the vehicle.

B. Resale Value

Future lightning protection systems not only need to improve vehicle performance, maintenance and operation, but should also provide the fleet with equivalent or improved resale value. This should be accomplished by adding protection to the vehicle while not compromising reliability of other electrical components.

