Review of Ford Motor Company's Test of FIRE Panel™ in a Simulated Rear Collision Scenario

Prepared for:

FIRE PANEL™ VEHICULAR FIRE PROTECTION SYSTEMS

Executive Summary

Ford Motor Company conducted a single test of the FIRE Panel™ technology to evaluate its performance in suppressing fires in police vehicles resulting from rear end collisions. The flawed test design and execution was not a reasonable evaluation of the technology. This report describes many of the problems and limitations of the testing.

The FIRE Panel™ system consists of ABC dry chemical fire suppression powder encased inside of a custom-molded plastic assembly. The powder is contained within cavities located inside the molded plastic panel. The plastic panel is adhered to the outside surface of the fuel tank and is designed to fracture and release the dry chemical when the fuel tank is impacted during a rear-end collision. When the fuel tank is pushed forward into the axle and other structures, the impact between the fire panel mounted on the front face of the fuel tank and the axle/differential assembly causes a release of dry chemical.

The single test conducted by Ford Motor Company on the FIRE Panel™ product imposed an unrealistic and invalid set of test conditions. The test conditions were arbitrary in many respects and there were numerous problems in test design, arrangement and execution as described in the report. While many potential problems with the test are identified and discussed in this report, three critical and obvious testing errors dominate the results. The arrangement of the simulated fuel tank and axle assembly, and the towing of this assembly at 30 mph prior to the simulated impact in order to simulate post-crash displacement of the target vehicle, was unrealistic and had a substantial negative effect on the test results. The induced 30 mph airflow at the time of panel actuation artificially reduced the suppressant cloud concentration at the ignition location. This effect does not occur to this extent in actual crashes since, in most cases, the target vehicle is at rest at the moment of impact and during the release of the suppressant powder. The impact of this effect was exaggerated by the delay in actuating the ignition source. A second major problem lies in the simulation of the fuel tank/axle assembly impact. The test simulated this impact by accelerating the simulated axle assembly into a stationary fuel tank as opposed to the expected scenario of the FIRE Panel™/fuel tank assembly being pushed into the differential/axle

assembly. Since the FIRE Panel™/fuel tank assembly was not moving forward during impact, as it would be in a rear end collision scenario the test did not realistically reproduce the discharge and dispersion of dry chemical from the FIRE Panel™. Finally, the use of a model rocket motor as an ignition source is obviously unrealistic, and especially critical in the evaluation of a local application aerosol fire-extinguishing agent. The effect of the model rocket motor in diluting and displacing the suppressant cloud at precisely the location where ignition is expected was critical to the outcome of the test and the effect obviously does not occur in any real crash scenario.

Given the list of problems encountered with this test it is not clear why only one test was conducted. In general, it is not possible to evaluate a product against a realistic set of scenarios and conditions with a single test. This fundamentally flawed single test was not a reasonable evaluation of the FIRE Panel™ technology.

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