Executive Summary of Crash Test Report:

1993 Ford Taurus Into 1998 Ford Crown Victoria Police Interceptor and 1994 Ford Taurus Into 1999 Ford Crown Victoria Police Interceptor

To date, 16 police officers have died as a result of their Ford Crown Victoria Police Interceptor (CVPI) being engulfed by fire after being struck in the rear at high-speed, while parked alongside the road. In each of these cases, the collision caused the fuel tank to be punctured, an ignition source ignited the fuel, and the resulting fire rapidly consumed the CVPI.

To demonstrate that the installation of a FIRE Panel on the axle side of the fuel tank enhances the level of safety of the CVPI, FIRE Panel LLC conducted two, high-speed, crash tests in November of 2003. These tests were not performed to determine whether or not a fuel tank might be punctured during a high-speed rear end impact—history has documented that the fuel tanks of CVPIs are punctured in many crashes. The FIRE Panel tests were done to demonstrate what happens when the tank is punctured by the crash, actual gasoline is leaking, and multiple ignition sources are present.

Image 1 – Ford Taurus on sled

Image 2 – Crown Victoria Police Interceptor

Image 3 – Bumper to bumper

Image 4 – 50% offset

Two CVPIs were prepared for the tests using identical protocols. In each test, a Ford Taurus was crashed into a standard, late model Ford CVPI at a high rate of speed. The Taurus made contact with the CVPI, centerline bumper to centerline bumper, at a 50% offset (35.3 inches) (see **Images 3 & 4**). Each CVPI had its fuel tank filled to 95% capacity (18.05 gallons) with regular-grade unleaded gasoline. To guarantee that the fuel tank would be punctured during the crash, a metal device with several points was welded to the rear driver's side axle with the points facing the fuel tank. The Taurus has its headlights on, as there is evidence that the hot filament in the headlight of a vehicle that hits the CVPI might be a potential ignition source. The CVPI had been driven into place, turned off, and then re-started 10 minutes prior to impact, hence the engine and exhaust components were at normal operating temperatures. At impact, the CVPI had its warm engine running and its transmission in "Park".

The CVPI had its headlights on and hazard lights operating, as this, too, created more ignition sources. To further assure that an ignition source would be present, two modifications were added to the CVPI. A spark generator (comprised of two metal cutting wheels that were applied with pressure to a piece of hardened angle iron) was installed to the underside of the CVPI under the rear passenger foot well. This spark generator replicated a piece of metal being drug down the highway that would create a "rooster tail" of sparks as the vehicle came to a stop. The other ignition source was a nickel chromium heating element that was energized and reached a temperature of at least 1,200° F before impact. This heating element was placed on the rear axle and in front of the fuel tank so that fuel vapors would be likely to come in contact with the heated element after impact.

Test #1 (1993 Ford Taurus into a 1998 Ford CVPI)
The Taurus was accelerated by a rocket-propelled sled and made contact with the CVPI at 79.9 mph. A fire is visible moments after the impact. After impact, the CVPI rotates approximately 310° as it skids 86' 7" down and 26' 5" across the cement test pad to a stop. The fuel tank was punctured during the crash. The leaking fuel ignited, trailed the CVPI and continued to fuel the fire once the CVPI had come to a stop.

Image 5 – Fire begins during impact

Image 6 – Fireball forms around the CVPI

Image 7 – Trail of fire from leaking fuel

Test #2 (1994 Ford Taurus into a 1999 Ford CVPI)
Test #2 used exactly the same protocol as Test #1, except that a FIRE Panel was installed on the axle side of the fuel tank (see **Images 8 - 10**). In Test #2, the Taurus was accelerated by the rocket-propelled sled

Image 8 – FIRE Panel installation

Image 9 – FIRE Panel raised onto fuel tank

Image 10 – FIRE Panel slid into position

and makes contact with the CVPI at 79.6 mph. Almost instantly, a cloud of fire suppressing powder was seen underneath the CVPI as well as surrounding the impact area of the two vehicles (see **Image 11**). Fuel leaked from the CVPI and a fuel trail was visible on the pavement; however, the fire suppressing powder continued to engulf the CVPI, even as it rotates approximately 330° (see **Image 12**). The powder "cloud" followed the vehicle to it resting place, 93' 6" down and 26' 3" across the test pad (see **Image 13**). The fire suppressing cloud remained in the proximity of the CVPI even after the vehicle had come to a stop. At that point, additional leaking fuel was observed coming from the fuel tank after the CVPI stopped.

Image 11 – Powder is released at impact

Image 12 – The powder formed a large cloud around the CVPI

Image 13 – The cloud of powder followed the CVPI all the through impact until it came to a stop

Conclusions:
The obvious difference between Test #1 (no FIRE Panel installed) and Test #2 (FIRE Panel installed) is that there is no fire in Test #2. The test protocols were exactly the same, and the impact speeds were statistically identical (79.9 and 79.6, respectively). In Test #2, the fire suppressing powder released by the FIRE Panel "inerted" the space adjacent to the fuel tank, the under area of the CVPI and the spilled fuel, thereby preventing the leaking fuel from igniting, even in the presence of various ignition sources.

The above images, as well as complete video documentation, clearly demonstrate the absence of a fire in Test #2. They further demonstrate that the fire suppressing powder released by the FIRE Panel was present around the CVPI's fuel tank from impact until after the vehicle came to a rest, 93' 6" down the test pad.

This simulation of a real-world crash in which a vehicle collided at high-speed with a parked, idling CVPI; the CVPI had real gasoline in its fuel tank; that fuel tank was punctured during the collision; fuel spilled onto the test pad; and defined ignition sources were present, demonstrated that the FIRE Panel significantly enhances the level of fire safety of the CVPI.