Tesla fire shows electrics face safety challenges

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In this June 22, 2012 file photo shows a Tesla Model S driving outside the Tesla factory in Fremont, Calif. Shares of Tesla Motors are down another 5 percent as investors in the high-flying company assess the fallout from a fire in one of its $70,000 electric cars. (AP Photo/Paul Sakuma, file)

When debris on a Seattle-area freeway pierced the battery of a

$70,000-plus Tesla Model S and touched off a raging fire, it raised new safety concerns for electric-vehicle owners.

It also caused rare jitters among investors, who of late have viewed Tesla as nearly invincible.

Electric vehicles have scored well in government tests of front and side crashes—the Model S earned the highest score possible. But Tuesday's incident demonstrates that real-world driving could reveal some vulnerabilities that don't show up in laboratory testing.

"The safety challenges related to electric cars are still in the early stages of being tested and addressed," said Karl Brauer, senior analyst at Kelley Blue Book.

Tesla said the Seattle-area driver hit a large metal object in the road, which damaged a battery cell and caused a fire. The company said the car acted as designed by containing the blaze in the front of the car.

Still, experts said Thursday that while incidents like this will happen again, they are rare. And electric cars still are safer than those with gasoline engines that haul around a tank full of flammable petroleum. The Tesla fire also shows that automakers need to bolster the shields around batteries, and that firefighters need more training to deal with electric car blazes.

Of the estimated 194,000 vehicle fires in the U.S. each year, the vast majority are in cars and trucks with gasoline or diesel engines. Electric vehicles make up less than 1 percent of the cars sold in the U.S.

Tesla says this is the only fire ever to happen in one of its batteries. Although a Chevrolet Volt made by General Motors caught fire two years ago after a government crash test, neither GM nor Nissan, which

make the top-selling electric cars in the nation, know of any real-world blazes in their vehicles.

In this Tuesday, Jan. 15, 2013, file photo, George Blankenship, Tesla Motors Vice President, Worldwide Sales & Ownership Experience speaks at media previews for the North American International Auto Show in Detroit. An Internet video of a fiery Tesla electric car near Seattle helped to push down the company's stock price Wednesday, Oct. 2, 2013. (AP Photo/Paul Sancya, File)

"If you think about what you'd rather be close to, 10 gallons (39 liters) of gasoline or a battery pack, I'd pick the battery pack every day," said Giorgio Rizzoni, director of the Center for Automotive Research at Ohio State University, where he is a professor of mechanical and electrical engineering.

Still, an Internet video of the Tesla fire spooked investors and caused a

sell-off Wednesday and Thursday. Tesla shares fell 6 percent Wednesday, and they closed Thursday down $7.64, or 4.2 percent, at $173.31.

At that price, Tesla's market value has dropped about $2.4 billion in the past two days. Still, if an investor purchased a share of Tesla at $35 on Jan. 2, they're sitting on a gain of nearly 400 percent. Tesla has dazzled Wall Street by selling more vehicles than expected and posting its first quarterly net profit earlier this year.

Deutsche Bank analyst Dan Galves, in a note to investors Thursday, said he expects bad news and investor concern to push down Tesla shares in the short-term. Investors, he said, will be concerned because electric cars represent a new technology with a high sensitivity to safety risks. But he wrote that the Model S has been collectively driven more than 83 million miles (134 million kilometers), yet this is the first fire despite 12 significant crashes and extreme testing by the government.

"We have confidence that this is an isolated incident that could happen to any vehicle," Galves wrote. He still thinks Tesla shares will reach $200.

Tesla said that on Tuesday the Model S warned the driver of problems from the collision. He pulled off the road, smelled smoke and saw flames. A company spokeswoman said the fire originated in a battery cell damaged in the collision, and the car's design prevented the fire from spreading to the rest of the battery and contained it in the front.

Thomas Habetler, an electrical engineering professor at Georgia Tech, theorized that the highway debris punctured a shield and a battery cell, causing a short-circuit, bypassing fuses and electrically linking one battery terminal to another. "You're going to have arcing and sparking in that case, which can cause whatever it is to light on fire," he said.

Leaking battery coolant also could have caused a short-circuit, he said.

Habetler and Rizzoni said electric cars are designed to withstand blows from highway debris. Fires are so rare that this one shouldn't give anyone pause if they're considering one, they said.

"My feeling is this was a case of prodigious bad luck," said Rizzoni.

Tesla said it already has inspected the Model S. Galves wrote that the company's ability to monitor cars remotely should result in a detailed report on the cause. It was still unclear Thursday if federal safety regulators would look into the fire because of the partial government shutdown.

Capt. Kyle Ohashi with the Kent, Washington, Fire Department said crews learned lessons from fighting the Tesla fire. For one, the dry chemical extinguisher seemed to work better than water to combat the blaze. And he said the department is now aware that accessing the battery pack in a Tesla is quite difficult.