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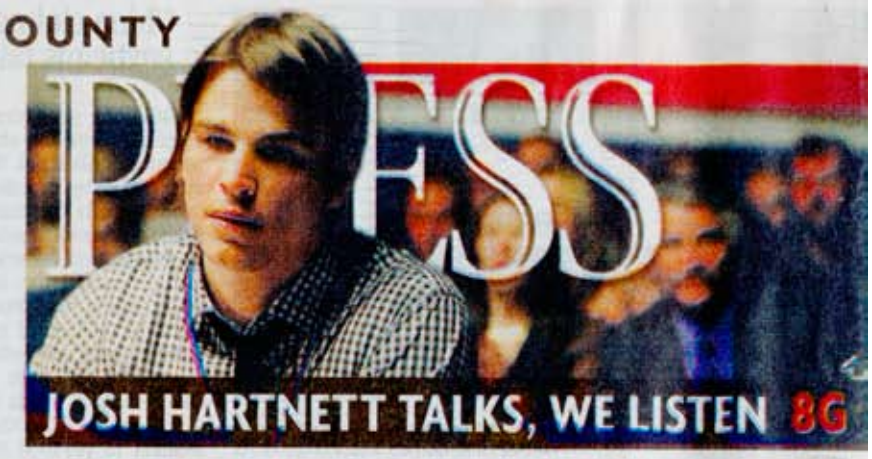

JOSH HARTNETT TALKS, WE LISTEN 8G

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Bridge probe turns to anti-ice system

Federal investigators want to determine if it contributed to corrosion on the I-35W span

BY JASON HOPPIN
Pioneer Press

Offering another look at the scope of its investigation into the collapsed Interstate 35W bridge, the National Transportation Safety Board said Wednesday it is studying an automated bridge anti-icing system installed in 1999 to help prevent accidents.

Much like highly corrosive road salts, the system prevented ice from forming and helped keep the bridge clear of snow. Investigators will study whether it contributed to corrosion on the bridge, which fell into the Mississippi River during rush hour Aug. 1, killing 13 people.

"It's one of the many things that we're looking at," National Transportation Safety Board spokesman Terry Williams said.

Over several years, inspectors noted corrosion on the bridge. And Minnesota Department of Transportation records show the agency's preventive maintenance to limit corrosion on the span was spotty.

However, corrosion was never thought to have reached critical levels, inspection reports say.

Two weeks ago, the NTSB said it was taking a hard look at the gusset plates, or steel connectors, used to join the steel girders of the truss bridge. NTSB Chairman Mark Rosenker repeated his agency's interest in gusset plates while in Minneapolis on Wednesday, but he cautioned that many potential causes are still being studied.

At the time, the I-35W bridge was the first of its size to be fitted with the anti-icing system. The system was credited with reducing accidents by 68 percent. MnDOT deemed the system so successful it was installed on several other Minnesota bridges, including the I-35E bridge over the Mississippi River south of St. Paul.

The $618,000 system also gave the I-35W bridge a nickname within MnDOT — the "Squirt Bridge."

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Ready to reconvene: Pawlenty says a special session on transportation is likely; legislative leaders are ready. **Page 1B**

Bridge probe

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It was made by New Castle, Penn.-based Boschung America, a subsidiary of a Swiss company. It used an anti-icing chemical called CF7, a potassium acetate-based liquid deicer manufactured by Fort Madison, Iowa-based Cryotech.

Potassium acetate is less corrosive than traditional road salts and widely used at airports because it is gentler on planes. However, one corrosion expert theorized automated systems could be of more concern since road salts are laid over ice and snow and diluted with water.

"From a corrosion point of view, as long as you're keeping that concentration (of potassium acetate) high, it makes no practical difference whatsoever," said Boris Miksic, owner of White Bear Lake-based Cortec Corp., which bills itself as an industry leader in innovative corrosion-protection systems.

"Combined with neglect and a lack of maintenance, the catastrophe was bound to happen."

Boschung America Vice President Justin Bruce said the anti-icing system has been used in Europe for more than 30 years. It has been installed on about 40 bridges in North America without any problems.

"As some people say, there's not a dog in the bunch. All our systems work," Bruce said.

Cryotech President and Chief Executive Officer Keith Johnson was skeptical that his company's product could have contributed to bridge corrosion.

"The product was developed primarily to be less corrosive than chloride-based salts," Johnson said. "If you look at the corrosive properties with respect to structural steel, I would guess they'd find that there is none."

With nearby St. Anthony Falls, the Mississippi River and exhaust from the 140,000 vehicles that passed over it each day, the bridge was susceptible to the formation of black ice. MnDOT spokesman Kent Barnard said CF7 was chosen because it is less corrosive and more environmentally friendly than typical deicing products.

The system discharges an average of 34 gallons per squirt from a 3,100-gallon tank on the north bank of the bridge. Barnard did not know how many times per winter it would discharge, but he said MnDOT would occasionally replenish its supply of CF7 from the Minneapolis-St. Paul International Airport, where it is dispersed on runways.

"It's kind of the standard for northern airports," Metropolitan Airports Commission spokesman Patrick Hogan said of the deicing liquid. "We haven't seen any evidence of it impacting the runways or any other pavement."

Experts say corrosion on the I-35W bridge should have been of particular concern since the roadway was situated above the steel supporting members.

That not only allows corrosive winter deicing salts and fluids to seep onto the steel beams that support the bridge, but makes such trivial-sounding issues as the accumulation of pigeon feces something to watch out for. MnDOT even installed plates over steel box beams to keep pigeons out.

> "Combined with neglect and a lack of maintenance, the catastrophe was bound to happen."
>
> *Boris Miksic, owner of White Bear Lake-based Cortec Corp.*

During a site visit for the media hosted by Hennepin County Sheriff Rich Stanek, rust was clearly visible in the piles of twisted steel, especially on the interiors of connection plates that had broken away from truss beams.

The Pioneer Press has previously reported that MnDOT had a spotty maintenance record on the I-35W bridge. A 1997 state audit also found that MnDOT wasn't keeping up with its own maintenance policies, and state legislators asked Wednesday that the audit be updated.

Much like washing road salts off a car, washing a bridge helps keep the steel from rusting away. But according to maintenance records provided by MnDOT, the bridge was washed — or "flushed" — just four times in the 40 years before it fell.

Paint is another way to prevent corrosion. MnDOT's own bridge-preservation guidelines state that painting can preserve the life of structural steel.

But the 1967 I-35W bridge didn't undergo a major repainting until 1999. As late as 2006, a state bridge inspector noted that if the bridge weren't replaced soon, a complete repainting should be performed.

The bridge's maintenance and inspection records are being weighed as investigators look into the cause of the collapse. "All of those records are part of our investigation," NTSB spokesman Williams said.

The NTSB also said the total added weight for the construction work being done on the bridge, including materials and equipment, was 575,000 pounds, or roughly the equivalent of seven 80,000-pound, maximum-weight commercial trucks — not even one for each of I-35W's eight lanes.

Put another way, Interstate 35 — including the I-35W bridge — was built to carry the U.S. military from Mexico to Canada. The main battle tank in use in 1967, the M60 Patton, weighed 60 tons. The construction weight was less than five tanks.

However, civil engineering experts have also pointed out that the location of the weight is as important as the weight totals. As part of its investigation, the NTSB is analyzing the weight distribution on the bridge at the time of the collapse.

The NTSB also said it was coordinating debris removal to ensure that critical clues to the collapse are preserved.

Investigators are compiling records on the bridge's design and the various construction projects over the years. More than 300 people have been contacted or interviewed about the collapse, the NTSB said.

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Bridge anti-icing system scrutinized

Installed in 1999 for $618,450, the Interstate 35W bridge's automatic anti-icing system was designed to avert dangerous black ice on the driving surface, which is vulnerable because of mist from nearby Lower St. Anthony Falls. In 2001, MnDOT hailed it as a success, crediting it with cutting the number of crashes by two-thirds. A similar system is in place on I-35E's span over the Mississippi River.

How it works:

Step 1: Weather stations, equipped with sensors and thermometers, determine when conditions are right for ice to form.

Step 2: Yellow flashing lights let drivers know when it's about to fire.

Step 3: 72 spray disks shoot deicing solution onto the road in short bursts.

What is the de-icing solution?

The system uses CF7, a potassium acetate-based liquid made by Iowa-based Cryotech. Used on airport runways, potassium acetate is different from traditional chloride-based deicers because it has a lower freezing point and is friendlier to the environment. According to Cryotech, CF7 contains a mixture designed to reduce corrosion to metal.

Source: Pioneer Press file graphic, interviews, MnDOT, Cryotech.com ALEX LEARY, PIONEER PRESS