



## Plucking lightning from the sky

**Engineers study dozens of hits a year on CN Tower to help global power firms protect their equipment**

August 11, 2009

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The clouds boiled with electricity, jagged strings of lightning scrawled across the sky like God's own cursive. Trees and power lines surrendered en masse below.

Caught between the two – wrapped around the inside of the CN Tower and swaying slightly in the wind – a six-metre coil endured burst after burst of energy, recording each blow.

Ali Hussein savoured the chaos.

For him, Sunday's storm meant one thing: data. "My colleagues and I look at these days as beautiful," said Hussein, a professor of electrical engineering at Ryerson and the University of Toronto.

Hussein and his colleagues study lightning. And despite living in a city where storms like Sunday's are rare, they're at the forefront of their field. Turns out the CN Tower is more than just a communications tower-come-tourist attraction. It's also a kind of laboratory – the perfect tool for recording lightning.

In fact, said Hussein, "Most of the time the tower triggers lightning. Because it's so tall and sharp, the electric field at its tip increases if there's a charged cloud above it. It produces what we call an upwards initiated leader, like connecting a wire between the tip of the tower and the charge centre of the cloud," he said. "That leader travels into the cloud and initiates the return stroke, which is what you see."

Two coils capture the current and direct it toward Hussein's equipment, which measures the strength and frequency of the flashes.

The tower was struck five times Sunday, all between 7:30 and 8:05 p.m.

On average, it is hit 75 times a year. Hussein, who has been studying lightning from the CN Tower for 21 years, measures every blast. "To be able to protect structures and power lines from lightning, you have to know what kind of current you're protecting them from."

His team reports to the International Council on Large Electric Systems, which shares data with power suppliers around the globe. But the CN Tower's international significance, at least in Hussein's field, is starting to wane. Towers are planned in Tokyo and Switzerland.

Still, what's one more blow to a structure that endures 75 a year?

*Outside is a regular feature on GTA weather. Send questions and suggestions to [naveling@thestar.ca](mailto:naveling@thestar.ca).*