A Big Brain for Power Plant Diagnostics

Remote diagnostics fixes problems, sometimes before they happen, and boosts peak performance in generation – even in remote areas such as the Moroccan desert.

Text: Eric Johnson Photos: Jann Averwerser

In artificial intelligence, what once was science fiction is now science fact. Already in 1996, a supercomputer called Deep Blue beat the then world champion Garry Kasparov in a regulation match of chess. By 2011, another supercomputer named Watson had bested the top (human) players of the television game show Jeopardy to win the first prize of US$1 million. Behind these lighthearted publicity stunts lies an undeniable truth: In some areas of knowledge, computers really can outthink a person.

In less-celebrated circumstances of ordinary life, this insight already is being applied. In healthcare, for instance, Watson has since gone on to work for an insurance company, offering guidance in the management of lung cancer treatment; and with success – his human supervisor told Forbes magazine that 90 percent of the nurses involved routinely follow the Jeopardy winner’s instructions.

The power generation industry also benefits from artificial intelligence. “Smart bots” built by Siemens are already in action, helping some 300 electric plants around the world to run more safely and better. Their influence is only set to increase.

I, Not Quite Robot

Not that they are called “smart bots.” Neither do they have individual names like Deep Blue or Watson. Nor do they function without considerable human involvement (then again, neither do Deep Blue nor Watson, which are serviced by numerous human programmers). But the principle behind Remote Diagnostics Services (RDS) is identical: to draw on massive...
Energy Service

says CEO José Luis Pastor of Moroccan “RDS sees things at a distance that our operator cannot see.”

Glen Fallon, CEO of Siemens Plant Operations Tahaddart SARL

“We have a problem, we can call on the whole of Siemens’ experience. Siemens is backing us with its entire company through RDS.”

José Luis Pastor, CEO, Energy Electric of Tahaddart

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Then the computer goes to work. Trends over time are identified and compared to the plant’s own history and to operating records of other, similar plants. In effect, the accumulated wisdom of Siemens is brought to bear to check the day’s work. This, Pernau points out, is far beyond what any operator (or person, for that matter) could be expected to do. Trends might be very subtle, such as a temperature creep in a certain unit of 0.1°C every day for ten days straight, or a switch turning on milliseconds late. They might be fiendishly complex, requiring complicated algorithms or case-based reasoning to unravel. They also might be insignificant, just random fluctuations within an acceptable range.

What RDS does is to sift and sort the measurements, flag potential problems, and post those to a protected on-site recorder and starting discussions with on-site operators or expert colleagues throughout the Siemens network.

Not many years ago, this remote analysis would have been impossible. Bandwidths were simply too narrow to accommodate the torrents of data now being funneled to Mülheim and Orlando.

Eric Johnson writes about technology, business, and the environment from Zurich. Formerly he headed what is now a Thomson Reuters bureau and corresponded for McGraw-Hill World News.

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