

A digital "stethoscope" for monitoring equipment

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Many technical facilities, such as power plants, are so complex that it isn't possible to continuously check all of the running machines without leaving a few gaps in the process. If there is a breakdown, the replacement of critical components such as turbines, generators, transformers, and important support systems is very complicated and can cost hundreds of thousands of euros. Power companies contract Siemens Energy to operate around 25 [power plants](#) worldwide, with a combined capacity of more than 15 [gigawatts](#). It is important for Siemens to be able to guarantee the highest possible operational availability of these facilities.

As a result, experts from Siemens Energy cooperated with the global research department Corporate Technology (CT) in Princeton to develop the mobile monitoring system. STEVE registers malfunctions before they can cause an interruption in operations, thus reducing down time. It is equipped with coin-sized sensors that can be affixed at various places on just about every machine. When STEVE identifies an abnormality, specialists from Siemens can assist operators at the plant with their analysis by cell phone.

The system detects noises, or rather structure-borne sounds, at a rate of

almost one million measurements per second - that's 25 times faster than the human ear. Additionally, STEVE is programmed to "learn" which machine noises and vibrations are characteristic of different operational states. After a data collection phase of about one week, STEVE can tell the difference between noises and vibrations that are normal and those that indicate a malfunction. The system is mobile, weatherproof, and easily transferable from one component to another, so it can periodically take measurements on many technical devices. Because of STEVE's ability to learn, it can be installed on practically any machine that emits vibrations.

Provided by Siemens

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