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SRNL and MES– Helping the Anchor Hold

AIKEN, S.C. (July 31, 2014) – A vital concern for cellular, broadcast, and emergency communications is the ability to maintain a safe, dependable communications tower. The danger is from more than just strong wind, but also the corrosion of underground anchors that help support these tall structures. Anchors can become pitted and weakened, and must be monitored on a regular basis. Researchers at the Department of Energy's Savannah River National Laboratory, in conjunction with Metallurgical Engineering Services, Inc. (MES), have developed a way to test the integrity of these anchors without digging away the surrounding soil. SoundAnchor™ performs inspections of tower anchors by using sound waves.

“SoundAnchor™ is a technique that applies ultrasonic frequencies to assess the condition of buried anchors that support towers,” explained SRNL Meteorologist Matt Parker, who helped invent the device. “The advantage is that this technique avoids expensive and damaging excavation processes and is more thorough in assessing the condition of the rods over just a visual inspection. SoundAnchor™ can be used to monitor trends associated with degradation due to corrosion.”

Anchor rod failure due to corrosion is a problem in every environment and every geographic region. Parker said the need for a more efficient method of testing rods became evident



*SoundAnchor™ device testing integrity of anchor rods
(inset: Corroded anchor rod at test location)*



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due to the lack of a robust technical and economic inspection method and an increased emphasis on worker safety. “Besides worker safety, ensuring rod integrity is vital during extreme weather events like Hurricane Sandy. The viability of the cellular network is enhanced greatly if the structures do not collapse under the duress caused by extreme wind or loads from heavy ice build-up. The Achilles Heel of most towers is the anchor rods,” added Parker.

The industry standard is to excavate each rod every three to five years to ensure its integrity. With nine meteorological towers and 27 anchor rods, Parker said the task was unappealing.

Parker and SRNL Non Destructive Examination expert, Bill Hinz, searched for a better technical solution. “We had to conduct a lot of testing to see how much degradation could be detected and how much was ‘too much’ via tensile testing of anchors in the laboratory. The final result was a far superior technique that cost about 10% of the damaging excavations.”

In order to get this technology to industries where it could be of most use, SRNL partnered with MES of Richardson Texas. “There are literally thousands of towers in the U.S. that can benefit from this technology,” he said. “MES has actually improved on SoundAnchor™ to make it easier to apply and provide more detailed results. This ability for a private company to take technology invented at the lab, and take it one step further for efficiency and safety, that’s satisfying for a researcher, and satisfying for the laboratory.”

“Bill and I are very pleased to see this technology used with private enterprise,” said Parker. “Climbing towers is inherently dangerous, so avoiding structural failures due to corroded anchor rods is a real plus. There is satisfaction in seeing home-grown, SRNL technology making its way into the private sector. The fact that it enhances safety is icing on the cake.”

The Savannah River National Laboratory (SRNL) is a multi-program applied research and development laboratory for the U.S. Department of Energy. SRNL applies state-of-the-art science and engineering to provide practical, high-value, cost-effective solutions for our nation’s environmental cleanup, nuclear security and clean energy challenges. Visit us on the web at <http://srnl.doe.gov>

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