Sometimes what you don’t see can cause you major problems.

Corona discharge is a good example. Dissipating energy given off by high-voltage infrastructure forms a corona that has the capacity for degrading insulators and causing failure.

Corona does not always become a short circuit. It can sometimes be described as a steady trickle, but over time corona discharge can lead to the complete breakdown and damage of electrical systems.

This ultraviolet radiation is invisible to the human eye. The radiation, however, is spread out over a range of wavelengths that can extend to longer visible wavelengths, but these are nearly impossible to see in daylight. Even in total darkness it is hardly visible and may be barely perceptible as a faint blue-violet glow.

Corona discharges offer up many adverse effects. These discharges cause interference with the reception of radio signals near high voltage power lines. There is also energy loss since the radiated energy “escapes” to the air; via UV radiation, and local heating caused by the plasma current.

The interaction of this energy manifests as an audible “crackling” due to the heating of air, but the most adverse effect is the detrimental impact on insulation due to heating and corrosive action. Once degradation begins, even at low levels of corona, cracks and voids appear.

Moisture can then penetrate insulation and components and further accelerate degradation. The damage to insulation components can lead to the shutdown of the entire power transmission system.
The human eye cannot see the UV coming from a corona, but the UV-260 Corona Camera can.

Regular inspections of high voltage systems are crucial to prevent corona discharges and eliminate them at early stages. Not doing these inspections so that your crews can take appropriate action may result in permanent and expensive damage and disruption to your operation and the services it provides.

The UV-260 corona camera detects and localizes corona discharges by detecting and monitoring the UV radiation from corona discharges. The UV emissions are displayed, superimposed on the UV-260 camcorder screen so you can precisely locate the source and record a still image or a video. A UV-photon volume counter helps you determine the severity of the detected corona discharge.

This camera has high sensitivity. The UV-260 is a powerful tool to detect UV emission in full daylight from sources both far away and nearby.

It is an ideal predictive maintenance device for inspecting, at a safe distance, high voltage substations and overhead transmission lines. This functional and easy to use tool can detect corona discharge for electrical utilities, HV research institutes, HV electrical component inspection, HV panel inspection, service providers, laboratories and more. The visible image helps to locate and frame the target for eventual repair.

The UV camera operates in both the visible and UV regions for viewing independent visible or UV images. The camera can superimpose the UV image on the visible image. UV radiation shows up on the screen as areas or blotchy spots of color.

The operator can choose the color of the UV spots as red, white, or blue, for the best presentation against different backgrounds, such as bright sky or complex installations. The camera captures and saves observed discharges still pictures, or it can record them as videos.

For long observations or to eliminate vibrations, the camera mounts on a tripod.
The easy to use, easy to handle UV-260, at just five pounds, is ideal for precise corona detection in the field. Sonel has designed the unit to have high sensitivity to UV signals for pinpoint location of corona-emitting sources. To aid visual detection of UV signals that the human eye cannot see, a 5.7” touch-screen equipped with a fast optical zoom brings UV images into auto-focus.

When inspecting long HV power lines, it is essential to record the target location. The UV-260 camera has a GPS module to save geolocation data onto the image file automatically. You can add voice notes to the image file using a headset or microphone to conveniently reference on-site conditions.

You can save recorded images and videos in standard file formats on a SD memory card to transfer to a computer for viewing and storage. Standard image or video viewing software can open the image and video files.

You can create reports on a computer and perform further analysis using the “Sonel UV Analyze” software to inspect and edit image and video files. The report can be arranged to include photos of damaged components, along with the UV radiation images or videos. The system enables placing visual information on a map with the GPS coordinates for eventual and easy follow-up, along with voice notes and recommendations for remedial actions.

Corona cameras have significantly improved the ability to detect incipient problems on high voltage infrastructures such as improperly mounted or faulty components (e.g., broken porcelain or glass insulators) in newly built and commissioned installations.

Moreover, they are beneficial for recording conditions as they develop and worsen in aging infrastructures. The early detection of corona enables the elimination of problems before they become more severe with damage and failure developing.

For these critical inspections, the Sonel UV-260 cameras are ergonomic, easy-to-use, and safe devices. Their small size and rugged construction make them ideal for field inspections, both indoors and outdoors.