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Effectiveness of Dissipation Array Systems (DAS) to “prevent direct lightning strikes”.

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Abstract

Dissipation Array Systems (DAS) have been marketed and sold as devices that “prevent direct lightning strikes by reducing the electric field to below lightning-collection levels, within the protected area” (website quote, Oct 29, 2019). Some vendor-provided performance statistics for DAS state that up to 100% of lightning strikes can be eliminated in the area where DAS are installed. The authors are not aware of any independent studies or analyses that verify the vendor’s claims and statistics. There are two case studies presented in this paper: 1) Tennessee Valley Authority (TVA) Browns Ferry Nuclear Power Plant installed a DAS system, and the plant was forced to reduce power generation in August of 2019 when a lightning strike interrupted power to the plant’s seven cooling towers and temporarily limited the ability to cool the heated water in the plant’s condenser, and 2) FedEx Super Hub Memphis, TN, has a large array of DAS installed. The National Lightning Detection Network (NLDN) data is reviewed and analyzed to evaluate an expected historical drop in lightning activity in the areas where the DAS are installed (according to the vendor’s claims). In addition, similar analyses are performed for the surrounding areas not covered by the DAS, where a drop in the lightning activity is not expected. Chronological lightning activity is analyzed as a function of DAS location, distance to DAS, and peak current.

Topic Areas

Applications of Lightning Data: Insurance Claims, Fire Risk, Mining, Wind Farms, etc.

Submission Format

Oral