



AC MITIGATION SOLUTIONS

**IMPROVE
PERSONNEL SAFETY**

**REDUCE INJURY
LIABILITY RISK**

**IMPROVE FINANCIAL
BOTTOM LINE**

**LOWER TOTAL COST
OF OWNERSHIP**

**LOWER DEPLOYMENT
COSTS & NPV**

**LOWER OPERATION
& MAINTENANCE
COSTS**

**REDUCE PIPELINE
CORROSION CAUSED
BY INDUCED AC
CURRENT FLOWS**

**REDUCE PIPELINE
DAMAGE DUE TO
LIGHTNING STRIKES**

**DISSIPATE LARGE
SURGE CURRENTS**

**ENVIRONMENTALLY
NEUTRAL SOLUTION**

**ELECTRODE LIFETIME
2 TO 3 TIMES TYPICAL**

RISKS & VULNERABILITIES

Increasingly, land management regulatory bodies are requiring the development of utility and transportation corridors shared by a number of corridor services. Unfortunately, there can be serious consequences when services do not play well together, especially where electrical transmission lines are co-located with metal infrastructure like pipelines. The interaction with potent electromagnetic fields can lead to:

- Substantially increased risk for personnel injury due to electrical shock or electrocution, driving up liability risk and insurance costs
- Accelerated corrosion processes on the pipeline due to high induced voltages on the pipeline produced by co-located electrical transmission tower
- Increased risk of catastrophic explosion or fire due to lightning strikes on the pipeline or nearby corridor infrastructure
- Additional installation and operating cost overheads for protective AC mitigation systems, negatively impacting financial bottom lines

THE SOLUTION

An innovative, engineered AC mitigation pipeline protection system from SAE Inc that provides superlative performance and extremely low maintenance. A system designed to effectively manage high levels of induced AC current, that provides more protection over a longer life than current solutions, and that can be efficiently installed quickly and easily. Its unique characteristics include:

- Large diameter electrodes are formed from copper cores embedded in a solid Conducrete® surround that reduces corrosion and extends longevity
- Large electrode surface areas that quickly dissipate high levels of induced energy, whether from electrical transmission lines or from lightning strikes
- Energy is dissipated into the soil electronically, substantially extending electrode longevity without reducing operational electrical performance
- Electrodes are environmentally neutral, with very low corrosion rates and virtually no gas or particle dispersion into the surrounding soil
- Fast, efficient, continuous installation process ensures a correctly formed electrode with the copper core centered in the protective Conducrete®
- Engineered using advanced computer modeling tools
- Offered with complete installation and project management services

Typical AC Mitigation application with col-located pipeline and electrical Tx line

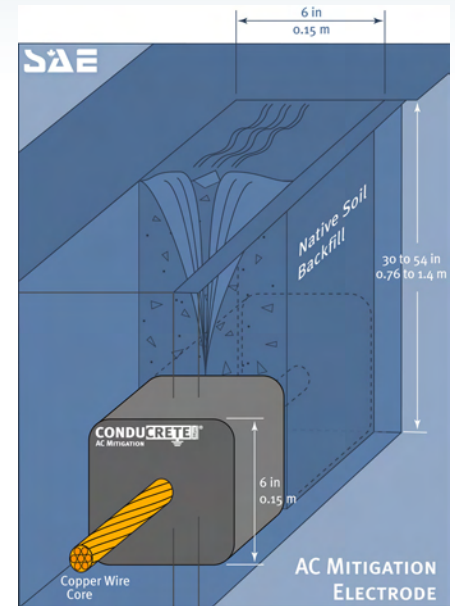


AC MITIGATION SOLUTIONS

THE TECHNOLOGY

Innovative AC Mitigation (ACM) systems technology from SAE Inc uses specially formulated materials to build electrodes with unique characteristics:

- Engineered and constructed using **CONDUCRETE[®] AC MITIGATION**, a hygroscopic carbonaceous material that “sets up” to form solid, robust electrodes resistant to damage;
- ACM electrodes feature large surface areas that minimize surface energy density and efficiently transfer energy into the soil electronically;
- ACM electrodes are water impermeable, significantly reducing deterioration and corrosion of the copper core;
- ACM electrodes maintain their excellent electrical performance characteristics over extended lifetimes that are 2 to 3 greater than typical AC mitigation solutions;
- ACM electrodes are pH neutral and chemically stable for low environmental impact;
- Systems are engineered to meet or exceed NEC and CEC requirements.



Detail of AC Mitigation electrode

THE FINANCIAL BENEFITS

Lower TOTAL COST OF OWNERSHIP (TCO) improves bottom-line financial results with cumulative savings from:

- Better personnel safety and lower injury liability risks;
- Reduced risk and potential liability costs of a catastrophic pipeline failure due to lightning or fault current;
- Prolonged pipeline and infrastructure service life by reducing the destructive effects of corrosion due to induced AC currents;
- Lower maintenance, operational and replacement costs due to extended longevity of AC mitigation electrodes;
- Lower AC mitigation system material and deployment costs.



Plowing in an AC Mitigation system along a pipeline right-of-way

THE TECHNICAL BENEFITS

- Excellent electrical performance with low impedance, high capacitance electrodes that feature large surface areas and cross-sections;
- Large surface area allows energy to be safely dissipated into the soil more rapidly and with less electrode damage;
- Large cross-section efficiently dissipates high surge currents;
- Robust electrode design resists damage from heavy service vehicles on the right-of-way;
- The SAE Inc electrode design permits fewer or shorter electrode runs compared to traditional Zinc Ribbon or Aluminium Anode string systems;
- SAE Inc AC Mitigation systems provide extended longevity of 2 to 3 times that of traditional systems;
- Designed for fast, efficient continuous installation process.