

Russell Corrosion Consultants
A Wholly Owned Subsidiary of EN Engineering

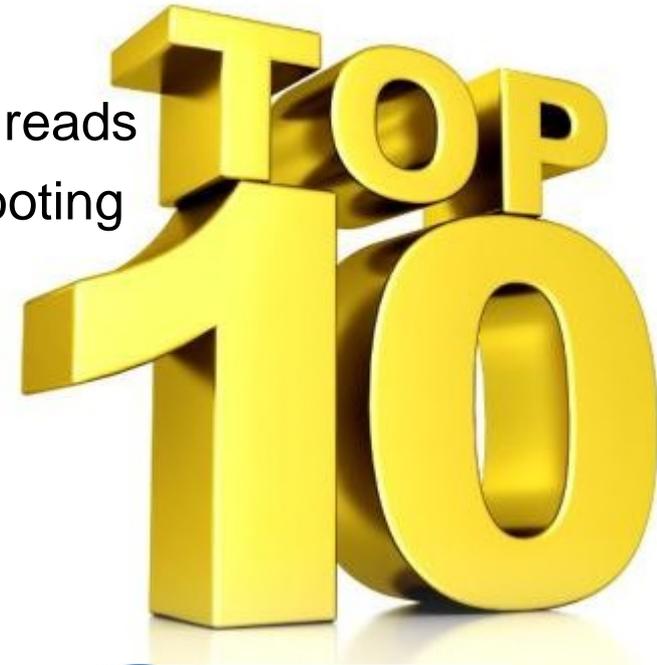
Corrosion and Integrity Engineering Services

Pennsylvania PUC Gas Safety Seminar

September 9, 2015

Top 10 Reasons Oil & Gas Clients Utilize RCC

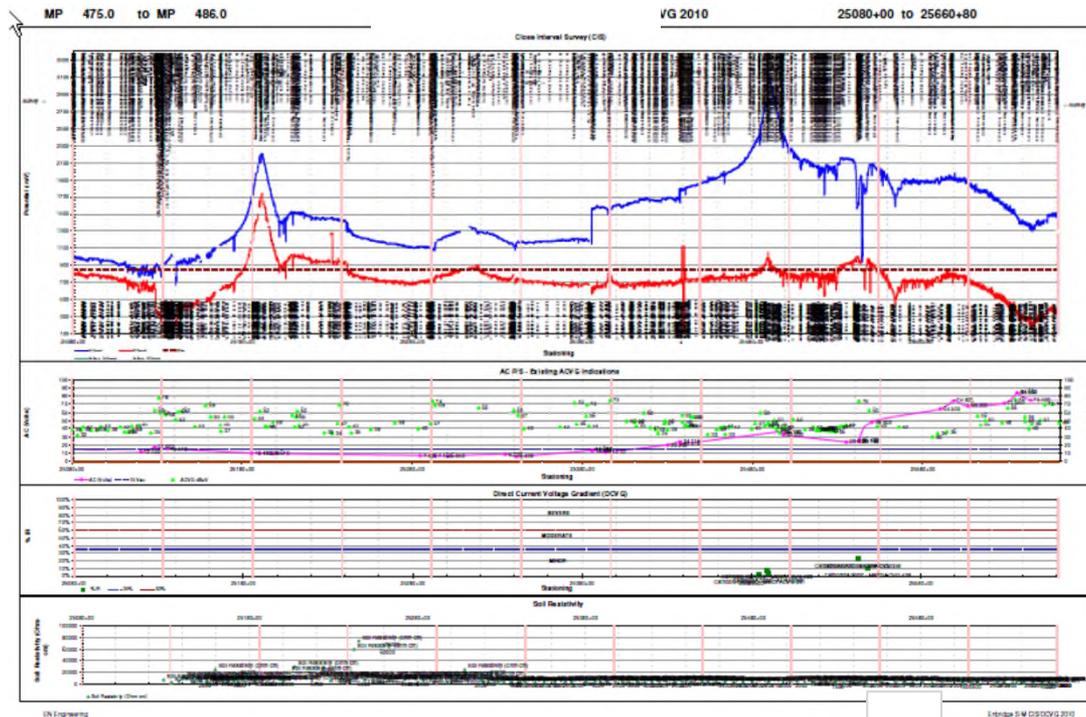
- #10 – Expert Witness Testimony
- #9 – Construction Inspection
- #8 – In Depth Audit/Compliance Assistance
- #7 – AC Mitigation Engineering Design Services
- #6 – Cathodic Protection Surveys
- #5 – External Corrosion Direct Assessment
- #4 – Cathodic Protection Design Services
- #3 – Technician Assistance, i.e. Compliance reads
- #2 – Cathodic Protection System Troubleshooting
- #1 – Sole Focus is on Engineering Only



AC Mitigation Myths and Unknown Facts

“Induced AC does not affect CP systems. Adding more CP will protect the pipeline.”

- High AC levels work to depolarize CP levels on the pipeline.
- Adding additional or excessive CP can have detrimental effects on the performance of the CP system.



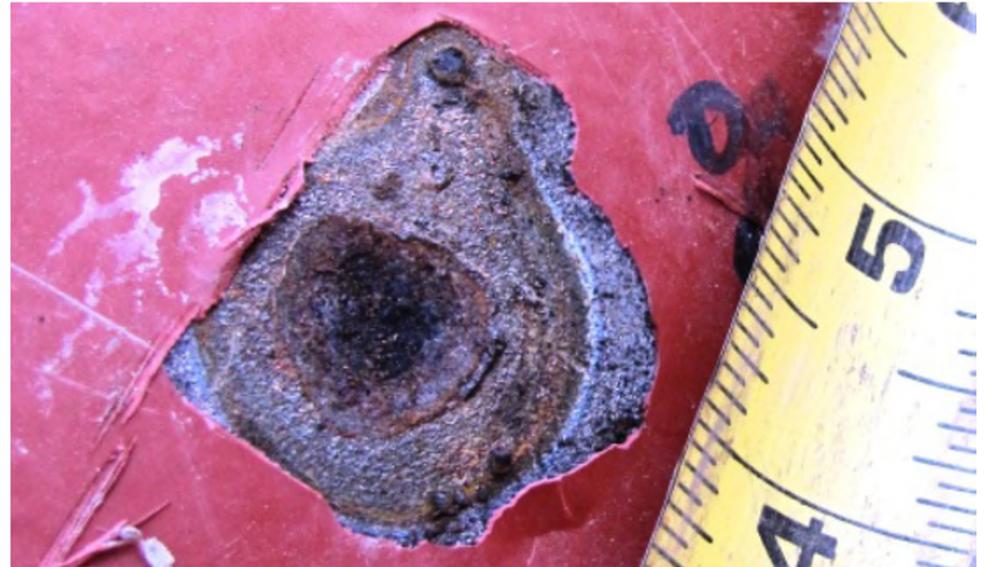
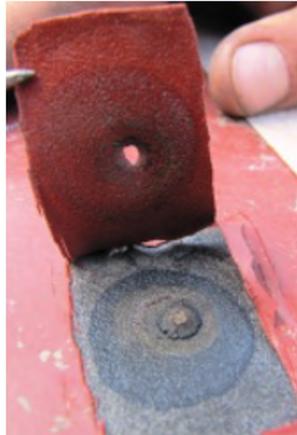
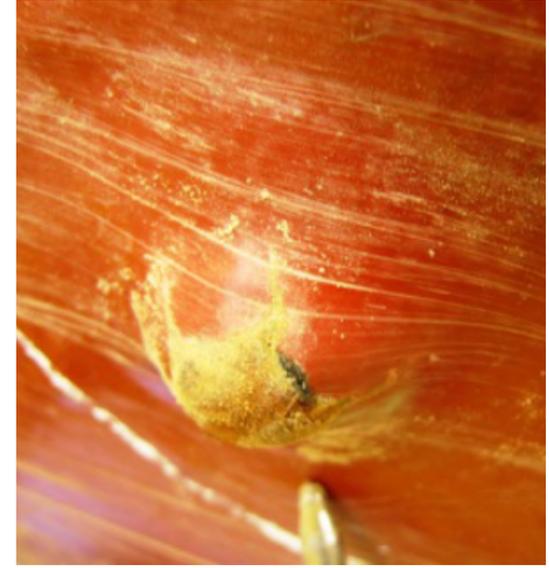
AC Mitigation Myths and Unknown Facts

“AC Corrosion is different from AC Safety.”

- **AC Corrosion is an AC current discharge phenomena at a coating holiday.**
- **AC Safety is a voltage issue.**



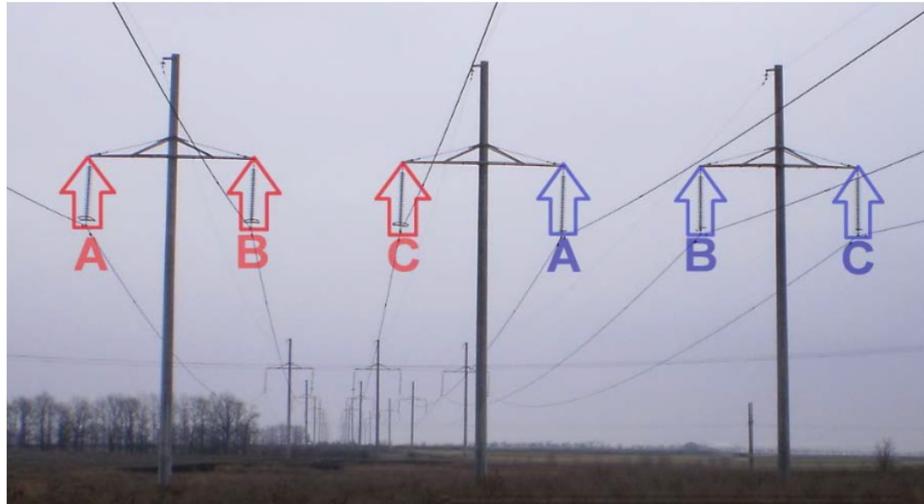
AC Corrosion Examples



AC Mitigation Myths and Unknown Facts

“All AC Modeling Software Is The Same.”

- **Advances in software include:**
 - **Multi-layer soil analysis**
 - **Unlimited # of powerline circuits & substations**
 - **Unlimited pipelines, railroads**
 - **Complicated CP or AC grounding structures**
 - **Multiple foreign bonds**
 - **Modeling of phase unbalances between wires or one phase wire out of service**



Where Can We Assist?

