

Invitation for Proposals

CEATI International Inc. (CEATI)
1010 Sherbrooke Street West, Suite 2500
Montreal, Quebec, Canada H3A 2R7
Website: www.ceati.com

**OVERHEAD LINE DESIGN ISSUES & WIND AND ICE STORM MITIGATION
INTEREST GROUP (WISMIG)**

CEATI PROJECT No. T123700-3386

CORROSION ASSESSMENT OF TUBULAR STEEL POLES

CEATI International Inc. (CEATI) invites the submission of proposals to perform research work on the following topic:

TITLE

Corrosion Assessment of Tubular Steel Poles

INTRODUCTION

Tubular steel poles are used as structural supports for a number of transmission lines, often for aesthetic reasons, and recently utilities have started using steel poles in areas subjected to hurricanes as steel poles have proven to be more resistant to impact under extreme wind loadings. In most cases for 115 kV–230 kV lines (and even on some 345 kV lines), the steel poles are directly embedded into the ground for foundation support. The portions of the steel poles near and below ground level are in a variety of soil types and are exposed to various atmospheric conditions and subject to corrosion of steel. Corrosion effects may manifest in serious coating (galvanizing and painting) failures and could also cause material loss. Such corrosion can result in costly outages due to steel pole failures and increased restoration and refurbishment costs.

Visual inspection by excavation of the steel below ground is the predominant method used by utilities for inspecting for corrosion, but the process is labour intensive, costly, and practical only to a small depth below ground. To overcome this, a number of techniques have been developed over the last decade to assess the condition of below ground steel by conducting tests at the steel pole site (e.g., pH measurements, soil resistivity, Redox potential, half-cell measurements) or by employing non-intrusive techniques (e.g., cylindrically guided wave techniques, magnetostrictive sensors, electrochemical impedance spectroscopy, electromagnetic coupling), which have been used in the field in only a few cases. The accuracy of the results using these methods is not well demonstrated.

PROJECT OBJECTIVES

The objective of this project is to critically evaluate these measurement methods and non-intrusive techniques to assess their applicability, the accuracy of results obtained, and their limitations (if any) for assessment of the existing condition of the below grade steel and coatings for steel tubular poles.

SCOPE OF THE STUDY

The scope includes comparing the results obtained by various techniques available for the assessing the condition of the coating and steel of the near and below ground portions of tubular steel poles and predicting further material loss in future years. This will include contacting various service providers who have experience in conducting non-intrusive condition assessment of below ground steel for transmission structures (e.g. EDM, Matco Services, Osmose Utilities, ITF) to gather information about their techniques and to arrange for them to conduct tests at two WISMIG participant utilities who will also excavate the selected steel pole sites to compare actual condition with the results obtained from the non-intrusive investigation and then preparing

a report containing the details of the investigation and analyzing the accuracy of the results obtained.

To help address the project objectives and scope, the following tasks may be required:

1. Contact at least three service providers providing corrosion assessment and material loss prediction, and mitigation methods for assessment of steel pole coatings and materials near and below ground, and gather information about their techniques to evaluate their suitability for steel pole applications.
2. Contact at least two WISMIG participant utilities who have experienced steel pole corrosion and will provide at least three sites for conducting tests by selected service providers and later excavate the sites for visual inspection and share the results for this project.
3. Compare the results obtained at the various sites and by the various techniques with the actual conditions as observed after excavation.
4. Investigate techniques to provide prediction of future material loss due to corrosion for tubular steel poles near or below the ground line. This will include defining the critical steel section loss parameters for the steels commonly used in transmission tubular steel pole structures and providing an analytical method for determining critical section loss. The methodology should allow for taking into account the utility specific load factors, strength reduction factors, or safety factors.
5. Prepare a comprehensive report with details of the investigation and comments on the accuracy of the non-intrusive technique results obtained and the techniques and methodologies for future material loss calculations.

POTENTIAL BENEFITS

The project would provide transmission utilities with a report on the existing non-intrusive methods for assessing the corrosion of steel poles, the accuracy of the results obtained, and how to predict material loss over the coming years.

DELIVERABLES

Project Report:

The deliverable will be a comprehensive report that provides clear guidelines to utilities in assessing the in-service condition of transmission steel poles. This report will also provide a clear methodology for determining critical steel section thickness loss and include recommendations on the most effective non-intrusive method(s) presently available. The report will include details of the investigation into the current condition assessment techniques of near and below ground portion of steel poles. It is understood that some of the finer details of some methods may be proprietary; in such cases the report can detail the requirements and provide an overview of the process and results of that method sufficient to allow utilities to make an informed choice about what methods would work best in their system, terrain, or jurisdiction.

The successful proponent is expected to prepare a ready-to-publish report on the results of the investigation and present the results to funding consortium members. The completed report must be submitted for CEATI approval in editable, electronic format (Microsoft Word). In addition, the platform and version should be specified for any software or programs to be developed. Should Excel or Access files be developed, compatibility with version 2003 is required.

Progress Reports:

Progress reports, in reasonable detail, will also be required on either a quarterly or milestone basis—normally these are scheduled to coincide with the completion of the identified tasks. It is expected that the details submitted with the progress reports would also be incorporated into parts of the final project report.

Power Point Presentation:

A ten to fifteen (10-15) slide Power Point Presentation is required to summarize the work. This should be composed of three main sections:

1. The factors motivating the initiation of the work;
2. A description of the main findings;
3. Summary of the conclusions and recommendations for future research.

Technical Brief:

The successful proponent shall prepare the contents for the Project's Technical Brief. This is a summary of the report (between 1,000 and 1,500 words), which is published separately by CEATI. Proponents are not responsible for the preparation of a ready-to-print Technical Brief, but solely to provide the contents for the following 4 sections: Background, Summary, Conclusions, and Recommendations.

1. The Report Background section should be short (approximately 200 words) and should detail the reasons the work was conducted.
2. The Summary section should be approximately 700 words. It must provide a general description of the work program.
3. The Conclusions section should be about 150 words and should provide a general outline of the key results (do not include specifics).
4. The Recommendations section should be about 200 words and should include a description of the potential applications of the results.

Please note that all reporting must be submitted in English. If written English is not the author's strong suit, it is recommended that a technical writer be hired to review the document prior to submission.

BUDGET AND SCHEDULE

The proposal must contain a schedule and a quote of required remuneration for the work in US dollars. Proponents' responses to this section must include a full breakdown of the budget and schedule, including an indication of rates and hours and the task allocation for the key personnel by task and must correspond to any phases or milestones outlined above. (Please refer to the Proposal Template for more information).

It is estimated that the budget for this project would be around \$90,000 USD. It is expected that this project can be completed (draft final report submitted for review and approval) within twelve (12) months of initiation.

The proposal must include the names and qualifications of the key individuals who will be involved, as well as the name of the accountable manager.

CEATI is not bound to accept any proposal but any selection will take into account technical merit (as displayed by the description and details presented in the proposal regarding the ways in which the proponent plans to meet the scope and objective of the project), qualifications including relevance of the experience of the proposed project team in undertaking similar work, price and schedule. A proposal may be accepted in whole or in part. A commitment to proceed with the first phase of a multi-phase project does not automatically imply that the work of the subsequent phases will be undertaken.

ALTERNATIVE WORKS

Proponents shall generally follow the above description of work, but are encouraged to offer alternative works if these alternatives will meet the objectives and provide a better end product to the utilities sponsoring this work. Alternatives shall be fully described including logistics explaining why the alternate works are being offered and the benefits to be realized by the funding utilities. Where alternatives are proposed, separate budgets shall be calculated for each alternative.

SUBMISSION OF PROPOSALS

The consideration of proposals received will be limited to those who indicate their intent to employ a suitable experienced project team and who possess proper facilities to perform the work. Receipt of this “IFP” does not necessarily constitute a prior determination by CEATI that your organization has the requisite experience and facilities.

The proposal must be properly completed and executed in accordance with the CEATI guidelines available at <http://www.ceati.com/technology-providers/submission-guidelines>, and shall be submitted to CEATI as an attachment in Microsoft Word at the following website: <http://prs.ceati.com/proposals/>. Be sure to indicate project number “**T123700-3386**” on the submission form. For assistance, please contact us at 514-866-5377.

The successful proponent will be required to sign the CEATI Standard Agreement upon project initiation. Proponents are encouraged to download a copy of the Standard Agreement for review from <http://www.ceati.com/technology-providers/submission-guidelines> prior to submitting a proposal, if they are not already familiar with these terms. Proponents may contact CEATI at projects@ceati.com to discuss any questions or concerns regarding these terms.

CLOSING DATE FOR RECEIPT OF PROPOSALS

Thursday, February 9, 2012, 4:00 pm EST

Now: Friday, February 17, 2012, 4:00 pm EST