

**Invitation for Proposals**

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

**CEATI PROJECT No. T103700-3373**

**TECHNOLOGY WATCH ON  
NEW CONDUCTORS FOR TRANSMISSION LINES**

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

**TITLE**

*Technology Watch on New Conductors for Transmission Lines*

**INTRODUCTION**

With the growth of electric loads in communities across the world, there is an urgent need to increase the power flow capacity of existing transmission lines. De-regulation, competition for electric power generation and the increased usage of green power are significantly changing the power flow across most transmission networks. Power utilities may also face challenges in building additional power lines. Some of these challenges are attributable to limited availability of new right of ways and significant public opposition to the construction of new lines, even on existing right of ways. As a result, transmission utilities are exploring ways to increase the power transfer capacities of existing transmission lines to reduce congestion and maintain reliability.

One of the alternatives is to up-rate, i.e. to increase the thermal rating of the existing circuits, provided there are no other system constraints. An acceptable method for increasing the thermal rating of existing lines is the development and use of conductors with nearly the same cross-section and per-unit weight as the conductors in service but capable of operating at higher temperatures while exhibiting low sags so that minimum electrical clearances may be maintained without structural modifications. With this in mind, attempts have been made over the last decade to develop several new types of conductors known as high temperature low sag (HTLS) conductors. Some of these conductors have been used on pilot projects and on existing lines to study their behaviour and identify any issues related to their use. A considerable amount of information about these new conductors is available in the public domain, but it has not been collected in one place and therefore it is difficult to assess the full extent of the advantages and disadvantages of the use of HTLS conductors.

The intent of this project is to prepare a state of the art report containing details about these new conductors.

**PROJECT OBJECTIVES**

The objective of this project is to prepare a state of the art report containing details about new HTLS conductors, the situations under which they should be used, the experience gained so far in their use, the gaps in knowledge, their initial and life cycle costs, and any known construction and maintenance issues, etc.

**SCOPE OF THE STUDY**

This project will investigate the new types of high temperature low sag (HTLS) conductors being developed and becoming available for commercial use. All HTLS conductors are to be addressed, including conductors such as ACSS, Gap Conductor, Invar Conductor, ACCR, ACCC, etc. The characteristics and behaviour of these new conductors shall be compared to the

ACSR conductors most commonly used, and a state of the art report shall be prepared to document all information obtained. Topics to be discussed include all aspects related to transmission lines, including material behaviour, design, construction, accessories, initial and life cycle costs, the impact on existing line rating methods, selection criteria, in-service experience, etc.

The scope of the work shall include but may not be limited to the following tasks:

- Conduct a literature review on the various types of HTLS conductors and the accessories used, including their operating temperatures and sags in comparison to the current industry-standard ACSR conductor.
- Identify their initial and life cycle costs.
- Note any changes required in construction and maintenance procedures, as well as repair procedures if required.
- Assess the applicability of each HTLS conductor for increasing power capacity and its behaviour under various climatic conditions.
- Document changes required in design practices.
- List the accessories to be used and their availability.
- Survey the current uses of the HTLS conductors and their performance to-date, as well as identifying any research pertaining to their long term performance and/or expected life.
- Identify any gaps in the new conductor technology.
- Prepare a comprehensive report and presentation on the subject.

Some work has been done previously by CEATI on transmission line conductors. On request, one copy of the applicable CEATI reports will be furnished to successful bidder for use during the execution of this project. No copies may be made of the reports and all reports must be returned to CEATI at the conclusion of the project.

### **POTENTIAL BENEFITS**

This study is intended to provide utilities with a state of the art report about new, emerging HTLS conductors to enable the utilities to assess their applicability for increasing the power transfer capacity of their transmission networks.

### **DELIVERABLES**

The primary deliverable shall be a detailed report comprising a comprehensive discussion and compilation of the results of the investigation and including a bibliography and copies of any papers and other information used to reach the conclusions and recommendations stated in the report. The proponent should be prepared to present the results of the work in person at one of the biannual WISMIG meetings.

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).

Progress reports will also be required on either a quarterly or milestone basis - normally these are scheduled to coincide with the completion of the identified tasks. Progress reports must make reference to the tasks identified in the proposal stating the percentage completed to date for each task.

The successful proponent is also expected to provide the following:

- A ten to fifteen (10-15) slide Power Point Presentation. 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.

- 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 or Canadian dollars. All prices shall be presumed to be in Canadian dollars (CAD) unless explicitly specified otherwise in the proposal. 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 expected that this project can be completed (draft final report submitted for review and approval) within nine (9) 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, qualifications, 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 proposal shall include a clear and detailed description of the tasks to be completed including the methodology for completing the tasks.

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/guidelines.php>, and shall be submitted to CEATI as an attachment in Microsoft Word at the following website: [www.ceati.com/private/submissions](http://www.ceati.com/private/submissions). Be sure to indicate project number “**T103700-3373**” on the submission form. For assistance, please contact us at 514-866-5377 x 236.

### **CLOSING DATE FOR RECEIPT OF PROPOSALS**

**Thursday, April 1, 2010, 4:00 pm EDT**