Cross-industry Ecosystem Energy Transmission

Request for proposal for 3D tower reconstruction

Contents

1. About the Cross-Industry Ecosystem

Infront Consulting & Management GmbH is operating a Cross-industry Ecosystem in the Energy Transmission Sector with the following members:

- Austrian Power Grid AG
- 50Hertz Transmission GmbH*
- ELIA Transmission Belgium S.A./N.V.*
- Swiss Federal Railways SBB*
- Swissgrid AG*
- E.DIS AG
- Red Eléctrica de España, S.A.U.*
- VINCI Energies Europe East GmbH

Ecosystem Members who are participating in that RFP

The objective is, to explore new technologies, to improve maintenance and inspection processes in the energy grid. That happens by conducting joint Proof-of-Concepts (PoC). More information can be found here: https://www.infront-consulting.com/cross-industry-innovators/

Infront's role is the Ecosystem Orchestrator, who helps to scope and kick-off new PoC's. In that role Infront is publishing the RFP on behalf of the participating Ecosystem Members.

2. Need definition

This Request For Proposal (RFP) involves creating reliable 3D-models of complex lattice (plus steel and concrete) towers. Lattice towers are used in multiple sectors (overhead line electricity transmission, transport and telcom). The most famous lattice tower is the Eiffel tower. The towers for electricity transmission are on average around 40 meters high. They have complex and very varying structures. The complex structure makes reality capture a real challenge. Being able to reconstruct the towers into 3D models would fulfil multiple needs.

One of these assets, overhead power lines where pylons are a key component, are designed to be in operation for many decades. It is not uncommon for pylons to be built 50 or 60 years ago. This is a time where documentation practices were different and fully paper based. For some of these pylons there are no available drawings or designs. In such cases, dedicated workforces are needed to measure dimensions of each element of the pylon, in particular the dimensions of the multiple pylon bars (including deep) and the screws. This involves a lot of manual labor doing work at height which has a lot of associated risks.

Lidar technologies have been evaluated to achieve the millimetric precision but don't provide such accuracy.

The challenge is to find new technologies and solutions able to elaborate a design of a real pylon including the dimensions of the different components with the required accuracy.

The use cases that the cross-industry ecosystem have collected are as follows:

Use case	Description
Structural stability assessment	Sometimes the structural stability of a pylon must be assessed. Examples are line repowering assessments, damage assessment, construction planning. For this high accuracy measurements of the dimensions of the different pylon pieces is required, usually millimetric precision.
Verify as built	After construction the as built situation has to be verified by an inspection. Performing a clash detection with a 3D model built by a scan would speed up the verification.
Paint estimations	With good volumetric models it would be possible to correctly estimate the surface area of towers and determine the amount of paint necessary
Lifecycle management	Information on which and the amount of the materials allows to plan re-use, recycling, and disposal
Planning	For repair and construction planning the partners need accurate measurements and good digital models

The ecosystem proposes a two-stage challenge.
- Technology proposal submission as outlined in section 4. This is the goal of this proposal request.
- The most promising solutions <u>can</u> be selected to conduct a Proof-of-Concept (PoC) on existing infrastructure with one of the partners. This depends on the geographic zone of the selected contender. The expected outcome of these tests is outlined in section 3.

3. Expected outcome of the Proof-of-Concept

The expected outcome from the PoC is an automated process from real world data capturing to 3D-model. Specifically, real world data capturing is mentioned to allow technologies outside of traditional LIDAR and photogrammetry scans to be accepted.

The specifications of the 3D-model would be as follow:
- Accuracy of 0 – 20mm, preferably around 1mm
- Output data: IFC-file (including Native Data, like Revit-Files, PLS-CADD-Tower-Files, XML)

- Solution must operate in electromagnetic fields
- Following requirements would be additionally nice to have
  - Detection/classification of assets and materials
  - Accuracy of 1mm
  - Software/platform can be linked with common CAD software

To further guide the applicant, we want to stipulate what we're looking for and what we're not looking for. This is outlined in the following table.

What we are looking for	What we are not looking for
Automatic process to generate a 3D (CAD) model in IFC format from a scan.	Manual process to verify pointcloud classification
Solution for the whole process. Scans (LIDAR, Photogrammetry) could be obtained from one of the partners. Applicants are also allowed to partners up with a third party. This must be explicitly mentioned in the response.	A partial solution for one of the steps: - A point cloud - A photogrammetric model - A classification and segmentation model for point clouds - Matching database/objects
Solutions that are new and groundbreaking. They don't have to be typical from the industrial sector.	
Bidding consortiums with different skills from different industries	
Hybrid approach combining computer vision, laser scans, and photogrammetry	

4. Proposal guideline

4.1 Proposal

The proposal should have maximum 1 page information on the applicant. It should include company profile and references. The solution proposal should be maximum 5 pages. It should include a description of the proposed methodology and action plan. It should detail the technology applied in every step and the requirements from the applicant to obtain them. It should also have references of already conducted tests, steps, or products from the applicant.

4.2 Evaluation of the proposal

The proposal shall be evaluated on the following criteria:
- The feasibility of the proposed solution
- The solution should provide a high quality 3D (CAD) model.
- Previous experience and level of maturity of the technology
- Compliance with terms and conditions
- The quality and completeness of the proposal
- Price

4.3 Other terms and conditions

A fixed price is requested for the proposal. Currency is Euro. The proposal should have a validity of 90 days.

All proposals should be delivered by Monday, 2nd of September 2024 EOB. It should be sent to the following email t.haustein@infront-consulting.com. It should contain 'RFP 3D construction' in the email title as reference.

Questions can be sent from

- 24.05.2024 – 6.07.2024 to t.haustein@infront-consulting.com
- 17.07.2024 – 02.08.2024 to g.schoenfeld@infront-consulting.com

This RFP does not constitute an irrevocable offer by Infront and the partners it represents. There is no guarantee whatsoever that a PoC will be carried out. It does not imply in any way that they must conclude an agreement with one of the applicants. More generally they are not bound in any way. No rights can be derived from this publication.

Applicants are aware that all exchange of data and documents under this RFP is to be considered strictly confidential. If an applicant is selected a confidentiality agreement shall be signed and purchasing terms and conditions shall be met.

5. Attachments

5.1 Attachment 1: Non-Disclosure Agreement (NDA)

Please referee to the next page.

Non-Disclosure Agreement

between

Infront Consulting & Management GmbH
Neuer Wall 10
20354 Hamburg, Germany

- hereinafter referred to as "**Infront**"

and

_____
Company Name

_____
Street, Number

_____
Postcode, City, Country

- hereinafter referred to as "**Solution Provider"**

- jointly hereinafter referred to as the "**Contracting Parties**"

1. Subject of the contract

1.1. Infront will exchange confidential Information with the potential Solution Provider. The purpose of this Non-Disclosure Agreement is to regulate the exchange of Information regarding the confidentiality obligations of the Contractual Partners for the submission of an offer to the Request for Purchase "3D Tower Reconstruction" (RFP).

2. Confidential information

2.1. Confidential Information within the meaning of this Non-Disclosure Agreement is all Information that
   a. have been expressly designated as confidential by one of the contracting parties or both contracting parties
   b. belong to information protected under §§ 17 and 18 of UWG (German Act on Unfair Competition) in particular know-how
   c. are protected by industrial or other property rights, e.g. design material for software within the meaning of § 69a (1) UrhG (German Copyright Act)
   d. fall under a statutory or contractual duty of confidentiality or are of a similar nature with regard to the need for protection, e.g. banking secrecy, data protection or professional secrecy in the case of lawyers, tax advisors or auditors
   e. in which the secrecy interest of the disclosing contracting party arises from the nature of information

2.2. The term "Information" in the aforementioned sense includes mainly the exchange of all kinds of information who are necessary to submit an offer for the RFP.

2.3. The respective Contracting Party of the Information hereby grant the other contractual party the limited and non-exclusive rights:
   a. to store the Information on GDPR compliant systems within the EU,
   b. to use the Information for all tasks related to the successful submission and selection of a potential Solution Provider.

2.4. It is expressly understood that the copyright, if any, of the Information remains the exclusive property of the respective Contracting Party. The Contracting Parties shall not acquire any ownership rights or claim to the copyright of the Information through this arrangement. Any use of the Information beyond the scope of this agreement or for purposes other than the specified case requires explicit written permission from the Contracting Parties.

2.5. The concept of confidential Information does not include Information that
  a. is publicly known
  b. is published after written declaration of the disclosing Contracting Party to waive the protection
  c. became known to the receiving Contracting Party by means other than through the disclosing Contracting Party and no obligation of secrecy was violated by anyone in the process

In case of doubt, the Contractual Partner who invokes one of the above exceptions must prove its existence.

3. Permissible activities and prohibited actions

3.1. The Contracting Parties are granted the right to use the IOnformation in the manner that is appropriate and customary for the performance of the collaboration.

3.2. Information received may be provided only to those salaried employees involved in the collaboration and only to the extent appropriate to the employee's job responsibilities under the collaboration.

3.3. Information may be made available to external consultants insofar as these consultants are subject to a duty of professional secrecy and it is necessary and expedient for the collaboration.

3.4. Information may be disclosed to third parties if the disclosing party has given its prior written consent. If the third party is an affiliated company of the receiving contractual partner within the meaning of §§ 15 ff. AktG (German Stock Corporation Act) and its involvement is necessary and expedient for the project, the other contracting party may not refuse its consent without good cause.

3.5. Any statutory or official disclosure obligations of the contractual partners shall remain unaffected.

3.6. Neither party may use, exploit or apply for or create proprietary rights in the other party's confidential information unless otherwise expressly agreed in writing.

4. Duties

4.1. The Contractual Partners shall protect and secure the confidential Information with the necessary care, or at least with the care with which they protect their own comparable information. Information is secured for administration that misuse and unauthorized knowledge are excluded.

4.2. Each Contracting Party may demand from the other Contracting Party that a person taking notes be obligated in writing to maintain confidentiality in accordance with this Non-Disclosure Agreement and that this be proven to the demanding Contracting Party in advance.

4.3. Each Contracting Party shall inform the transferred Contracting Party immediately and in writing if it has knowledge or even suspicion of an imminent or occurred violation of the confidentiality interests of the other Contracting Party. This also includes knowledge or suspicions outside the collaboration in this project.

4.4. Each Contracting Party shall inform the other Contracting Party without undue delay in a case of item 2 of a statutory disclosure obligation or an obligation based on an official order.

5. Agreement duration

5.1. Unless otherwise agreed between the Contracting Parties, this confidentiality agreement shall apply in perpetuity.

5.2. The agreement may be terminated by either Contracting Party at any time.

6. Duration of effectiveness

6.1. Unless otherwise agreed, the obligations under this non-disclosure agreement shall continue to apply permanently beyond the end of the agreement.

7. Final provisions

7.1. Changes and additions to the agreement must be made in writing to be effective.

7.2. The place of performance and jurisdiction for all disputes arising from and in connection with this agreement shall be the Contractor's registered office, provided that the Client is a merchant, a legal entity under public law or a special fund under public law.

7.3. Should any provision of this agreement be or become invalid in whole or in part, or should the agreement be incomplete, the remaining content of the agreement shall not be affected. The contracting parties undertake to replace the invalid provision with a provision that comes as close as possible in economic terms to the meaning and purpose of the invalid provision in a legally effective manner.

_____, _____   _____
City   Date   Company Name

_____   _____
Name of Legal Representative   Signature of Legal Representative