

ASSET MANAGEMENT DEMONSTRATOR

RFP to test *new technologies* that will enable Elia Group to reach its objective of tracing the cause of overhead line incidents in ten minutes.

Elia Transmission Belgium



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1. About Elia Group

The Elia Group, with its two transmission system operators, Elia Transmission in Belgium and 50Hertz Transmission in Germany, is one of the top five transmission system operators in Europe. With a 99.999 percent reliability level, the TSOs operate 18,990 km of high-voltage connections that supply power to approximately 30 million end-users (big companies and households).

We provide a stable electrical system for society, which is critical for socioeconomic progress. We also want to be a driving force behind a successful energy transition to a system that is reliable, sustainable, and affordable. The Elia Group fosters both the unification of the European energy market and the de carbonization of our society by developing international high-voltage connections and integrating ever-increasing volumes of renewable energy output. Elia Group is also producing market products and innovating its operational procedures to allow innovative technologies and market parties to use our grid, permitting the energy transition to take place.

Visit <https://www.eliagroup.eu/> for additional information.

2. Partnership assignment

2.1 Background

As a part of a bigger innovation vision at Elia Group, we have implemented the “Moonshot” program for each business area. The aim of the Moonshot program is not only to tackle the future’s biggest challenges within, and beyond, Elia Group but also be able to demonstrate them in a concrete, end to end manner. Within the asset management business area, we need to make sure that ‘we keep the lights on’ while our assets can be turned off by incidents.

The electricity grid continues to evolve by incorporating new types of assets, adding new grid phenomena and generators (renewables) and a rising energy load, meaning the grids are closer to operating at their maximum capacity and rapid changes of energy levels make them more prone to vulnerabilities. This changing and dynamic environment favors more and more unexpected incidents to occur leading to a negative impact on energy consumers and even temporary blackouts.

The goal of the asset management moonshot is to re-think the incident analysis journey for overhead lines and to be able to reach the goal of quickly tracing the cause of incidents, with the target of 10 minutes post event.

While we use an automated tool developed to track and give information on certain characteristics of incidents (such as location, voltage, current characteristics, fault impedance etc.), we are unable to identify the cause of the incidents. Today, in order to get to the cause of such incidents, we need to perform foot patrols which are slow, costly and have safety concerns. With the benefit of initial information on the cause of incidents, our teams in the field can better prioritize their efforts on the incidents with highest severity and impact.



2.2 Incidents Explained: Definition, Categories and Distribution

Definition of incidents

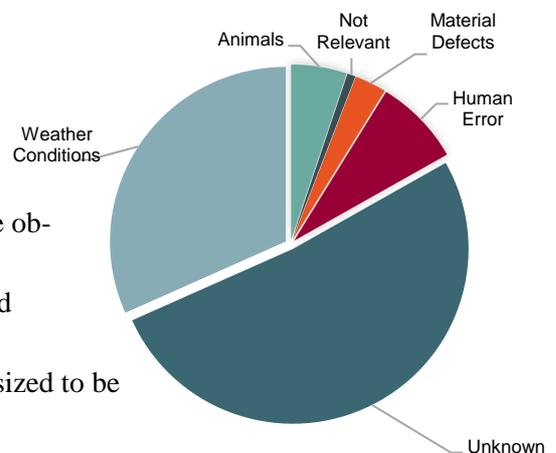
It is worth explaining that incidents in Elia Group have a specific definition, which includes every event that forces the opening of the circuit breaker (caused either by a short circuit or by a device that has asked the circuit breaker to open). Incidents can be caused by an asset failing but does not mean that all incidents turn into failure. Incidents can have different external causes, e.g., weather (thunderstorm), crane interference with the line, material failure, etc. Due to their geographical spread, incidents on overhead are of particular interest to be investigated and focused.

Incident categorization based on external cause

Based on historical existing records we account for approximately 2200 incidents on overhead lines over the past 10 years, which roughly translates into ~ 220 incidents a year.

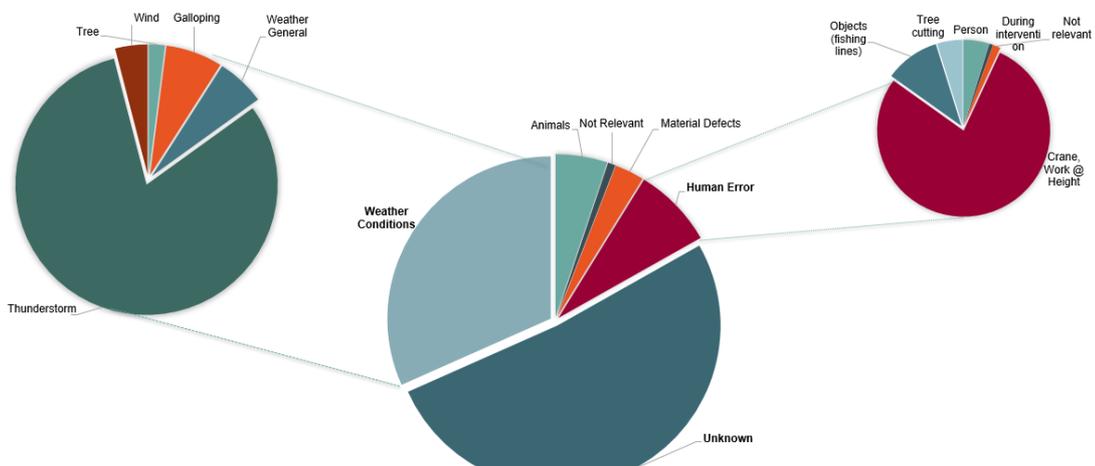
Below main categories are recorded after a post-incident foot survey has been performed on the incident location.

- **Unknowns: 52%** are accounted all incidents where the origin remains unproven. This is usually the case when cause has disappeared when technicians get into the location of the incidents
- **Weather Conditions: 32%** where subcategories include lightning strike, storm, galloping, snow are observed
- **Human Error: 8%** includes subcategories like 3rd party, direct and latent human error
- **Animals: 8%** where main subcategory is hypothesized to be birds



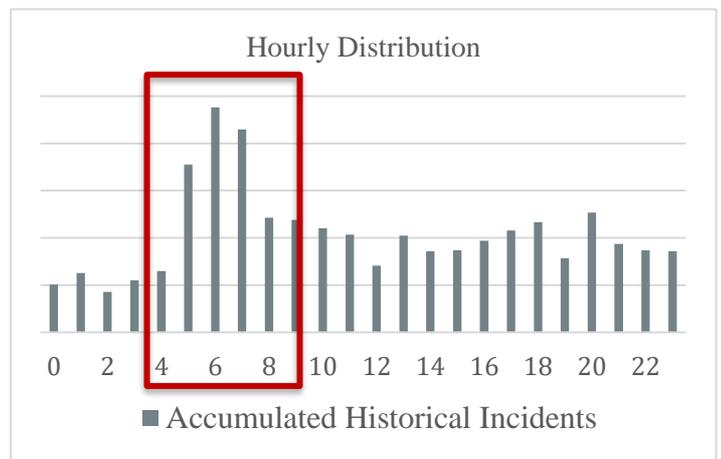
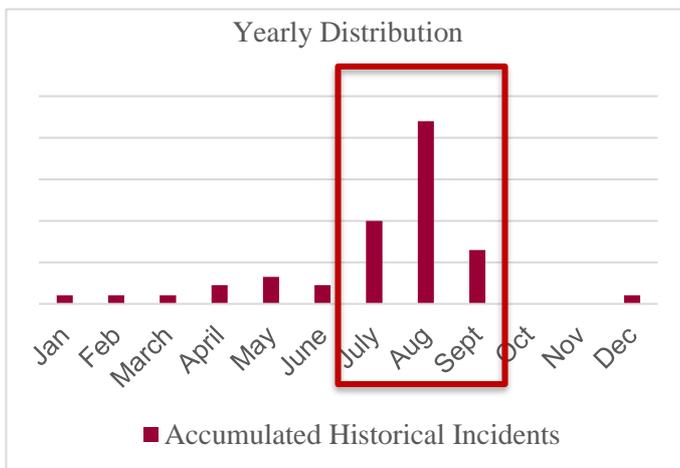
Source: internal historical data





To get a better understanding of certain categories, we do, where possible, categorize further as shown above.

Yearly and Hourly Distribution



2.3 Technical Scope

The primary goal of the request for proposal is to assess, select and test a new technology that can capture and verify as many incident categories as possible and as real-time results as possible. The solution should be able to gather visual or other type of relevant data on the spot, after the incident has occurred, analyze the capture data, and present results in a near real time. After the selection process, a preparatory work will follow to define the execution area and fulfill all pre-requisites that would be needed to adapt such new technology for the test. Final execution of the technical feasibility will be

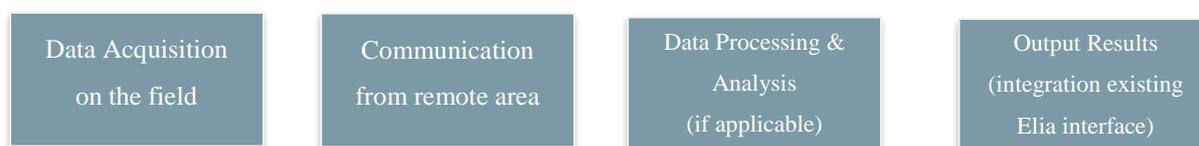


done under 'real grid environment' in a pre-defined segment of an overhead line in Belgium where the technology will be proven under real circumstances.

The solution should:

- Be innovative;
- Technical feasibility can be shown in a physical demonstrator, beyond laboratory and / or theoretical setting;
- End to end solution from data acquisition to end results via user interface;
- Produce results as near real time as possible, target is within 10 minutes post event;
- Be able perform during the night or bad weather;
- Give accurate information about the cause of the incident, certain accuracy is expected;
- Tackle as many incident categories as possible (see categories and subcategories above);
- be easy to use and its scalability to the whole grid is possible;
- be applicable and resistance to electro-magnetic environment around overhead lines;
- be safety compliant with Elia Group's guidelines;

The solution is expected to cover the below steps during the testing period:



In case the solution requires preparatory work to be tested, for example installation, permitting or other effort and costs, they should be explicitly mentioned, quantified and included in the price. Same applies in case there is maintenance or operational costs during the test period and/or removal effort.

2.4 Demonstrator

Due to the exploratory nature of such demonstrator, the technologies selected will firstly be checked for their technical feasibility in a limited physical perimeter and timeframe before any decision for further scale up.

Overall worthwhile mentioning:

- The overhead line perimeter chosen will be selected for its record of historical incident and particular location;
- Time frame: minimum two months and up to six months (ideally duration of three to four months of observation)
- Testing will be performed in Q2 – Q3 2023;
- simulated incidents but also observe 'real incidents' during this period;
- Distance of overhead line segment: to be defined, minimum coverage of 5 km up to 30km;
- Possibility to do preparatory testing possible;



3. Request for Proposal

Below, we list what the bidder shall include in his offer:

- Presentation of Company, highlighting presence, experience and knowledge of the power system;
- Description of technology and/or methodology work to achieve objective;
- Quantification of which incident categories and subcategories will be validated alongside metrics such as resolution of results, timing, and accuracy expected;
- Path to industrialization including maintenance costs for technology proposed, expected end of life and integration requirements (if any);
- State if possibility to ‘rent vs. buy’ the solution is possible for demonstrator purpose;
- Data communication, cybersecurity concerns, or other pre-requisites for it to work.

3.1 Currency and payment

- A fixed price is requested for the deliverables.
- All prices are in EUR.
- The final invoice can only be sent after validation of the deliverables by Elia Group.
- Payment terms are 30 days subject to confirmation of delivery and sending of invoice by the supplier.
- Without obligations for Elia Group: This RFP does not constitute an irrevocable offer by Elia Group, the tender does not imply in any way that Elia Group must conclude an agreement with one bidder and, more generally, Elia Group is not bound in any way whatsoever. No rights can be derived from this publication.

3.2 Other requirements

- Confidentiality: The bidder will process all data and documents obtained under this offer as strictly confidential.
- This tender is subject to the terms and conditions of purchases Elia Group.
- By submission of an offer, the Bidder agrees that the offer is irrevocable and binding for the Bidder until 90 days after the RFP.

3.3 Selection Process

The evaluation of the offer will be performed according to following criteria:

1. The feasibility of:
 - a. applying chosen technology to the objective;
 - b. solutions that are easy scalable to wider geographical area;
 - c. end-results within 10 minutes of event;
 - d. give information independently of time of day and other;
2. Its innovation degree;
3. Price will be a key criterion;
4. Previous experience and level of maturity of chosen technology;



5. Experience and references in similar projects and format;
6. Experience in the energy sector;
7. Compliance with contract and T&C; (*contract will be provided later on during negotiation*)
8. Quality and completeness of the offer;

All offers shall be delivered **by 29 July 2022 EOB**.

The file needs to be sent to [**irid.bufi@50hertz.com**](mailto:irid.bufi@50hertz.com) and [**innovation@eliagroup.eu**](mailto:innovation@eliagroup.eu), with the words 'RFP AM Moonshot' clearly mentioned in the subject. After a first evaluation of the offers and at sole discretion of Elia Group, a selection of the best bidders will be made and invited for a pitching session (date to be defined). All bidders will be informed by the latest 01.09.2022 whether they are invited or not. The pitching session will be organized online.

3.4 Contact

If you have questions about this RFP or need further information, please contact Irid Bufi, [**irid.bufi@50hertz.com**](mailto:irid.bufi@50hertz.com)

