CAS-03-2023 "Classification and traceability of cathodes in Electrowinning"

APPLY HERE

General aspects

The copper cathodes harvesting operation at Caserones Mine electrowinning (EW) facility includes a continuous stripping machine that is fed by the cathodes selected by the operators through a visual inspection. The grade A cathodes feed the machine and the rejected cathodes (grade R), which correspond to approximately 10% of the total production, are stored for later stripping.

This visual classification must consider the area and size of nodules, lack of copper deposit, presence of residual lead, sulfate, organic and other imperfections, which are established in internal procedures and protocols. However, this task is subject to human error and biases that are ultimately reflected in cathodes that are misclassified as either A or R grade.

The identification of these defects in the operation is not traceable, i.e. it is not possible to identify the cells from which the cathodes originate in order to take corrective actions at the source.

Aim and Scope

Technological solutions are sought to enable the following:

- Evaluate the physical characteristics of copper cathodes and classify them as grade A or grade R using artificial intelligence.
- Perform traceability of the cathodes to identify the cell of origin and its location within the cell.

Solution requirements

- Integral solution that includes sensorization, information processing platform and machine learning tools, deep learning, big data and/or others, that allow to optimize the algorithms for cathode classification.
- Solutions that allow acting through control ties on the PLC of the stripping machine to automate the entry or rejection of the cathodes are desirable.
- The solution should be adaptable and non-invasive, i.e. the devices or components should be easy to install/maintain and should not require major structural changes in the plant or electrolytic building.
- The components must be heavy duty (IP 67 or other) to ensure resistance to highly corrosive environmental conditions existing in the EW plant (acid mist, electrolyte, humidity and temperature).
- Delivery of daily and/or shift reports with classification statistics and traceability of cathodes in control room, mobile devices or wherever the customer requires.
- Comply with the safety, health, environmental and communications standards of Caserones Mine.

Current problem

Challenge

Although there are procedures and protocols for the classification of cathodes during harvesting, there are differences in the interpretation of which cathodes are grade A and which are grade R. In addition, there is no traceability to detect the cell and location of origin of the cathode.

Consequences

- Risks of penalties in the marketing of cathodes due to incorrect classification of grade R cathodes as grade A.
- Risks of certification and bonus losses due to incorrect classification of grade A cathodes as grade R.

When does the problem occur?

Permanently.

How is it currently resolved?

Visual inspection of operators and manual sorting of cathodes.

Technologies already tested

No technologies have been tested.

Excluded solutions

Within the background evaluation process, the following will not be considered:

- Solutions that generate important changes in the plant's infrastructure or that affect operational continuity.
- Advisories, consultancies or engineering studies.

Expande

Expande seeks to promote the development of ecosystems that allow the creation of virtuous cycles between industry challenges and innovative solutions from local and international suppliers. Under a model of open innovation and associativity, we seek that companies and suppliers capture value for their businesses through high impact technologies that contribute to a more sustainable industry.

Confidentiality

The delivery of personal information to register in the database, such as details related to technological solutions to apply for Expande's open innovation processes is strictly confidential; as is the information contained in the contact forms with information of these processes subsequent stages.
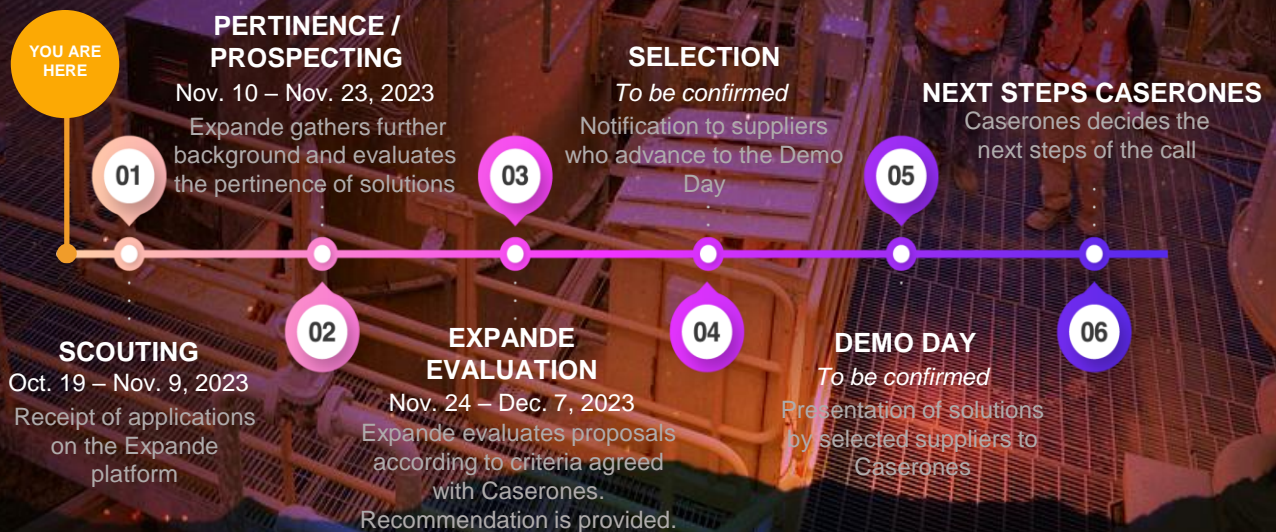
Required Information

- Technical background of the proposed solution
- Maturity level of the proposed solution (according to Technology Readiness Levels, TRL). Reference to success stories or background supporting the degree of maturity.
- Indicate relevant skills of the team members who will solve the challenge.
- Proposed business model: sale, service, license fee or other.
- International suppliers must mention availability to operate in Chile or through technical /commercial representatives

APPLY HERE

Milestones

YOU ARE HERE

01

PERTINENCE / PROSPECTING
Nov. 10 – Nov. 23, 2023
Expande gathers further background and evaluates the pertinence of solutions

02

SCOUTING
Oct. 19 – Nov. 9, 2023
Receipt of applications on the Expande platform

03

SELECTION
To be confirmed
Notification to suppliers who advance to the Demo Day

04

EXPANDE EVALUATION
Nov. 24 – Dec. 7, 2023
Expande evaluates proposals according to criteria agreed with Caserones. Recommendation is provided.

05

NEXT STEPS CASERONES
Caserones decides the next steps of the call

06

DEMO DAY
To be confirmed
Presentation of solutions by selected suppliers to Caserones