

SG-01-2021 “Integral management for the operation and maintenance of mining truck tires”

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General aspects

The tires of the mine extraction trucks (CAEX) are one of the main inputs in the transportation of material from the pit to the different destinations (plant, dumps, stockpiles). The useful life of these tires will considerably affect the operating cost as well as, in more extreme cases, the mechanical availability of the trucks and may even affect the achievement of production goals.

Objective and scope

Identify technological solutions that contribute to optimize the useful life of tires, avoiding their premature wear and damage as a consequence of their circulation on mine-plant circuit roads. Solutions are sought in the following areas (not excluding):

1. **Tire protection:** systems oriented to avoid physical damage as a consequence of blows with sharp elements or others.
2. **Condition monitoring:** Detection of regular/irregular wear, external/internal damage, operating conditions among others; in tires.
3. **Tire maintenance:** Predictive models to dynamically determine optimal rotation and/or replacement points.
4. **Road maintenance management:** Systems that allow the detection of damage or presence of material on the road for the optimal allocation of maintenance resources.
5. **Driver behavior:** Systems that allow the intelligent management of driver behavior using data from trucks such as: positioning, speed, driver identification, etc.

Excluded solutions

The following will not be considered in the background evaluation process:

- Assessments, consultancies or engineering studies.
- Proposals that require a change in the design and/or materiality of the tires.
- Proposals that consider only tire pressure and temperature monitoring.
- Proposals for the valorization of end-of-life tires (ELT).

Solution requirements

The proposed technological solution must consider the following requirements:

- Eliminate or reduce the risk exposure of people in the installation, implementation, operation and maintenance stages.
- Compatible with the operation of the mining truck tires used (Bridgestone and Michelin) without reducing the original structural condition.
- Software platforms and equipment with the capacity to interoperate with different Sierra Gorda information systems.
- Minimal maintenance requirements, with easy installation, removal and maintenance of the devices.
- Equipment and sensors with Heavy Duty constructability characteristics (prepared for adverse operating conditions such as: pollution, humidity, impacts, temperature).
- It is desirable but not excluding the application of analytical technologies, artificial intelligence or similar in cases of modeling and prediction.
- Comply with Sierra Gorda's safety and communications standards.

Current Problem

Challenge

Increase the useful life of tires used on the fleet of mining extraction trucks (CAEX).

Consequences

- Shorter service life: higher operating cost, lower availability of trucks.
- Worker exposure risk.
- Lower productivity in loading and transportation of materials.

When does the problem occur?

On a daily basis.

How is it currently resolved?

Daily visual inspections of road conditions are performed. In addition, visual inspections of tire condition and tire pressure and temperature monitoring are performed.

Tested technologies

No new technologies have been tested.

Expande Program

The Open Innovation in Mining Program, Expande, is a public-private initiative designed and carried out by Fundación Chile. The purpose is to drive innovation and make possible a better future for global mining, promoting the mining ecosystem in Chile along with building a collaborative model that enables the best solutions for the high complexity challenges of mining today and tomorrow.

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.

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Link

<https://fch.brightidea.com/SG012021GestionintegraloperacionmantneumaticosCAEX>

Required documents

Upload slide presentation or files (pdf, images, etc) with the information below:

- Relevant skills of the team members who will solve the challenge.
- Technical background of the proposed solution: description of the technology used, technical characteristics and details of the system or mode of application.
- Degree of maturity of the proposed solution (according to the Technology Readiness Levels, TRL classification) Make reference to success stories or antecedents that support the degree of maturity.
- Proposed Business Model: sale, service, licensing or other.
- Representative in Chile (for foreign suppliers)

Milestones

